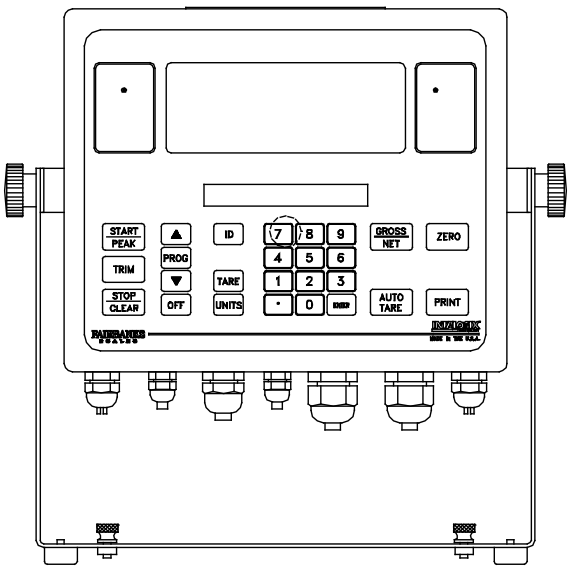
Operator Manual

2800 SERIES
INTRINSICALLY SAFE INSTRUMENT

ANALOG VERSION &
INTALOGIX™ VERSION

***NOTE*: Intalogix versions manufactured after 03/01/2019 are NOT approved for Division 1 applications.**



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2800 Series

Intrinsically Safe Instrument With Intalogix™ Technology

Document 50647

Manufactured by Fairbanks Scales Inc.

Amendment Record

Issue #1	09/01	Created and released manual.
Issue #2	11/01	Updated specifications.
Issue #3	03/02	Updated specifications and procedures
Issue #4	08/02	Updated specifications for 4-20mA
Issue #5	01/03	Updated drawings, note, and caution graphics.
Issue #6	11/06	Updated specifications for 4-20mA.
Revision 7	10/07	Updated format, images, and technical specifications.
Revision 8	07/09	Updated Control Drawings, formatting, added down weighing information
Revision 9	01/12	Updated Battery Charger revision information and FM Control Drawings in Appendix II.
Revision 10	08/14	Updated MSDS sheet.
Revision 11	07/15	Removed Security section
Revision 12	06/16	Added Epson 220 printer in Appendix VI
Revision 13	11/17	Appendix I: Troubleshooting/Error codes
Revision 14	05/18	Appendix VI: Updated wiring
Revision 15	02/19	Updated FM Control Drawings; Accessory 2850
Revision 16	04/20	Updated General Information/Fiber optics section

Disclaimer

Every effort has been made to provide complete and accurate information in this manual. However, although this manual may include a specifically identified warranty notice for the product, Fairbanks Scales makes no representations or warranties with respect to the contents of this manual, and reserves the right to make changes to this manual without notice when and as improvements are made.

It is the responsibility of the requesting party to develop, maintain, install, and connect networking devices and general network connectivity as it applies to the originating party's network. No warranty or guarantee, expressed or implied, concerning the network, its design, its installation, or operational characteristics has been offered by Fairbanks Scales. Fairbanks Scales shall not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether or not based on express or implied warranty, contract, negligence, or strict liability arising in connection with the design, development, installation, or use of an intended network.

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Section 1: General Information

1.1. DESCRIPTION

The model 2800 series is an Intrinsically Safe instrument utilizing Intalogix™ Technology. It is Factory Mutual (FM) Approved for direct use in hazardous environments as shown in the FM Approved Control Drawings.

The 2800 series instrument eliminates the need for explosion proof enclosures or purging systems. Enclosed in a **stainless steel, NEMA 4X enclosure**, the instrument can withstand both wash down and corrosive environments.

Major features of the Instrument include push-button programming and calibration, with data storage in nonvolatile ROM for **100% memory retention**.

The 2800 series instrument features a large **1.25-inch-high LCD weight display** with an additional alphanumeric status display, which can be tilted up or down to accommodate different lighting conditions. Its microprocessor-controlled design allows the instrument to be rapidly programmed at installation to meet the specific requirements of the application.

The obtainable accuracy meets Handbook 44 requirements, and the instrument is approved for **commercial application up to 10,000 divisions**. A maximum of 30,000 divisions can be achieved for non-commercial applications.

This ultra-low power instrument can interface to analog load cells through an Intalogix™ intrinsically safe controller or can be connected directly to analog load cells using an available optional accessory.

The instrument provides **fiber optic interfaces** from the hazardous area to the optional accessories located in a safe area. The optional accessories provide communications to various types of peripheral devices in selectable formats for RS232, and 20mA data outputs. Other available options include analog interfaces through programmable setpoints and 4-20 ma analog outputs. The instrument may be powered by a battery or a continuous power accessory.

1.2. SPECIFICATIONS

Instrument Approvals	• NTEP: CoC 01-009 • CWM: Pending
FM Approvals	• Class I, II, and III • Division 1 • Groups A, B, C, D, E, F, and G * For more detailed information, see **FM Control Drawing 21943.** *see* **Appendix II.**
Physical Dimensions	Approximately 13"W x 9"H x 3"D
Material	Stainless Steel
Enclosure Rating	• NEMA 4X • IP65
Capacities	Service programmable up to 999,950 lb, kg, oz, g, tons, lb-oz, or gallons
Division Sizes	• Service programmable for **.0002 to 50** • Fixed at one (1) oz. in the lb/oz mode
Resolution	• Commercial - Up to 10,000 divisions maximum • Noncommercial - Up to 30,000 divisions maximum
Sensitivity	• 1µv/d (microvolt/division)
Load Cells	Up to 16 - 350 or 1000 ohm impedance
Load Cell Cable Length/Wire Gauge	• 75' maximum • 20 AWG maximum
Display	Weight Display • 1.25" height • 7 segment LCD Status Display • .38" x 3.73" Alphanumeric LCD • 16 characters - .38" x .191" character size
Zero Range	Service programmable - Disabled, 2, or 100%
Auto-Zero-Tracking	Service programmable - Disabled, .5, 1, or 3 divisions
Motion Detection	Service programmable - Disabled, .5, 1, or 3 divisions
Digital Filter	Service programmable from disabled up to heavy
Display Update Rate	Service programmable settings from .1 to .8 seconds.
Environment	**Handbook 44 Compliance Tested Operating Environment** • Temp -10°C to + 40°C (+14°F to + 104°F) **Storage** • Temp -40°C to + 60°C (-40°F to + 140°F)
Chemical Resistance	Resistant to all petroleum derivatives and salts.

1.3. ACCESSORIES

1.3.1. ACCESSORY 2802 INTRINSICALLY SAFE CONTROLLER (22119)

- Each controller allows **up to four (4) load cells** to be interconnected
- Communicates to the Model 2800 Series Instrument using Intalogix ™ Technology
- Enclosure: NEMA 4X, Stainless steel

1.3.2. ACCESSORY 2825 SAFE AREA POWER SUPPLY (18448)

- This accessory will provide continuous power to the Model 2800 Instrument.
- The Accessory 2830 cannot be used with this accessory, as this accessory is installed in a non-hazardous, safe area only.
- Enclosure: NEMA 4, Fiberglass
- Output: **7 VDC**

1.3.3. ACCESSORY 2830 BATTERY (20615)

- Supplies battery power to the Model 2800 Series Instrument.
- It must be recharged in a non-hazardous, safe area using **Accessory 2845 or 2846 only.**
- **Accessory 2830** is the only battery approved to be used with the **Model 2800 Series Instruments** for all applications.

C A U T I O N

Battery surface gets *very HOT* during recharging!

***DO NOT USE* Accessory 2830 *in conjunction with* Accessory 2825.**

1.3. Accessories, Continued

1.3.4. BATTERY CHARGING

- Charging time is **16 hours** for a fully discharged battery.
- The battery requires recharging when the Recharge display appears.
- The battery may be recharged 100 - 500 times dependent on depth of discharge.
- Recharge intervals may vary depending upon usage.

Table 1 – Recharge intervals using **Accessory 2802**

	RECHARGING HOURS	
No. of Cells	350 ohm Load Cells	1000 ohm Load Cells
16	6	20
12	20	40
8	45	70
4	100	133

Table 2 – Recharge intervals using **Accessory 2830**

	RECHARGING HOURS	
No. of Cells	350 ohm Load Cells	1000 ohm Load Cells
16	85	133
14	90	150
12	95	172
10	100	184
8	117	199
6	133	219
4	175	247
3	194	266
1	269	320

1.3. Accessories, Continued

1.3.5. Accessory 2845 Battery Charger 110-120 VAC (31354)

(Replaces Accessory 2840 – 21199)

The Safe Area Smart Recharger uses the Battery Accessory 2830 *only*.

- The 2845 Battery Charger is plugged into a standard outlet.
- This accessory is intended for non-hazardous, safe areas only.

Follow these guidelines when charging **Battery Accessory 2830.**

- A charged battery can be left on the charger with no resulting damage to either the charger or battery pack.
- When a discharged battery is first connected to a charger, the status L.E.D. on the charger will be a constant yellow as it charges.
- Once the battery is fully charged, the LED remains a constant green.

C A U T I O N

*Battery surfaces get very **HOT** during recharging.*

1.3.6. ACCESSORY 2846 BATTERY CHARGER 230VAC (31466) *FOR ACCESSORY 2830*

- Equipped with a European Style 230 VAC plug.
- Used with the Battery Accessory 2830 *only*.
- Intended for non-hazardous, safe areas *only*.

Follow these guidelines when charging **Battery Accessory 2830.**

- A charged battery can be left on the charger with no resulting damage to either the charger or battery pack.
- When a discharged battery is first connected to a charger, the status L.E.D. on the charger will be a constant **yellow** as it charges.
- Once the battery is fully charged, the LED remains a constant **green**.

1.3.6. Accessory 2846 Battery Charger 230VAC (31466) for Accessory 2830, Continued

*The following chart outlines basic information for **both models** of battery chargers.*

INPUT VOLTAGE	• **2845 –** 120 VAC, 60 Hz – ***Standard style plug***
	• **2846 –** 230 VAC, 50/60 Hz
BATTERY OUTPUT VOLTAGE	7.0 VDC +/- 0.2 VDC at the end of charge cycle with battery connected.
LEADS	• Output leads 18 AWG, approximately three feet (3’). • Extended power cord up to six feet (6’).
STATUS L.E.D.	Brightness sufficient to discern the charge status under general office environment lighting.
CHARGING TIME	• Sixteen (16) hours maximum for undamaged chargeable battery (electrolyte not depleted). • Initial unloaded output voltage of 5.0 VDC. • ***Do not recharge a battery with a voltage below* 4.0 VDC**.
OPERATING TEMPERATURE RANGE	0°C to +38°C (+32°F to +100°F).

C A U T I O N

*Battery surfaces get very **HOT** during recharging.*

1.3.7. ACCESSORY 2850 SAFE AREA RELAY SETPOINT INTERFACE (20570)

- The setpoint accessory is service programmable for up to **eight (8) setpoints.**
- These setpoints may be configured to one of five different modes of operation.

  Enclosure: NEMA 4 Fiberglass
  Relay specifications: 24 VDC; 1 CA@28VDC, 120 VAC; 1/3 HP @ 120 VAC, 240 VAC

1.3. Accessories, Continued

1.3.8. ACCESSORY 2860 SAFE AREA DATA CONVERTER (20523)

- This accessory is service programmable and configurable for **RS232** or **20mA data outputs.**
- This accessory can also be configured to provide a 4-20 ma analog output.
- Enclosure: NEMA 4; Fiberglass
- 4 -20 ma Specifications: 16 bit resolution (+/- .01 integral linearity)

C A U T I O N

The 4-20ma accessory is a passive device!
The power is to be supplied by others, and *MUST BE* a *DEDICATED* and an *ISOLATED* power supply.

- Current loop voltage compliance: **7vdc minimum to 40vdc maximum** (typical voltage = 24vdc)
- Full scale settling time: **8msecs**
- Output impedance: **25 meg**
- Alarm current: **3.5 to 24 mA** (underload/overload conditions)
- Offset @ 25 degrees C; +/- .1% of full scale
- Offset drift: +/- 25ppm of full scale per degree C
- Total output error: 20mA @ 25 degrees C: +/- .2% of full scale max
- Total output drift: +/- 50ppm of full scale per degree C-max

1.3.9. ACCESSORY 2875 INTRINSICALLY SAFE INTERCONNECTION CABLE (21737)

- This is the only approved cable for interconnecting the Accessory 2802, and for connecting to the Model 2800 to the Accessory 2850.
- Specifications: 2 pair - 16AWG; 0.48" O.D.

1.3. Accessories, Continued

1.3.10. ACCESSORY 2880 ANALOG CELL INPUT (19797)

- This accessory allows for direct interface to a analog load cell(s).
- This accessory is complete, and is supplied with mounting hardware and an EPROM.

1.3.11. ACCESSORY 2900 SPLICE BOX (20310)

- Enclosure: NEMA 4X; Stainless steel

1.3.12. ACCESSORY 2910 SPLICE BOX KIT W/CABLES (20199)

- Enclosure: NEMA 4X; Stainless steel

1.3.13. ACCESSORY 5806 FIBER OPTIC CABLE (17229)

- This accessory allows a direct connection of the Model 2800 Series Instrument.
- It is located in the hazardous area to the Accessories 2850 and 2860, in the **non-hazardous, safe area** for I/O operation. Maximum fiber optic cable distance is 200 feet. Do not place the fiber optic cable within conduits.
- **Other notes regarding fiber optic cable**:

  Disposal Precautions

  Optical Fiber contains fluorocarbon resin and vinyl chloride resin. When incinerated, such products may generate corrosive and poisonous hydrogen fluoride gas or hydrogen chloride gas. It is necessary to observe the laws and regulations of the country or providence where the fiber is to be incinerated or buried for disposal.

  Precautions Against Physical Environmental Factors

  Do not apply force that exceeds the maximum allowable tension factor.

  Do not bend the fiber in a tight arc. If excessive stress is applied, especially near the connectors, optical characteristics may deteriorate. The radius of the arc in which the fiber is bent should not be less than the equivalent of 20 times the outside diameter of the fiber.

  NEVER INSTALL FIBER OPTIC CABLE IN CONDUIT

If it **MUST** be installed in conduit, MINIMIZE THE NUMBER OF BENDS AND PROVIDE SOME SLACK IN THE CABLE AT EACH BEND TO ALLOW FOR THERMAL EXPANSION OF THE CONDUIT!!!

One of the characteristics of Fiber Optic cable is that it's coefficient of expansion is negative. That is, when temperatures increase, the cable length decreases. For a given length of 30 meters (98.4 feet), with a temperature increase from 64 deg. F to 84 deg. F, its length will decrease approximately 0.12 inches. At the same time, the conduit (assuming it is aluminum) will increase in length almost 0.3 inches. The combined effect will be to stretch out the Fiber Optic cable within the conduit, and possible cause it fail. If you have to have the Fiber Optic cable installed in conduit, make sure it has slack at any bends in the conduit run.

Do not apply extreme twists to the Optical Fiber. The optical characteristics of the Optical Fiber will decline if used while being twisted.

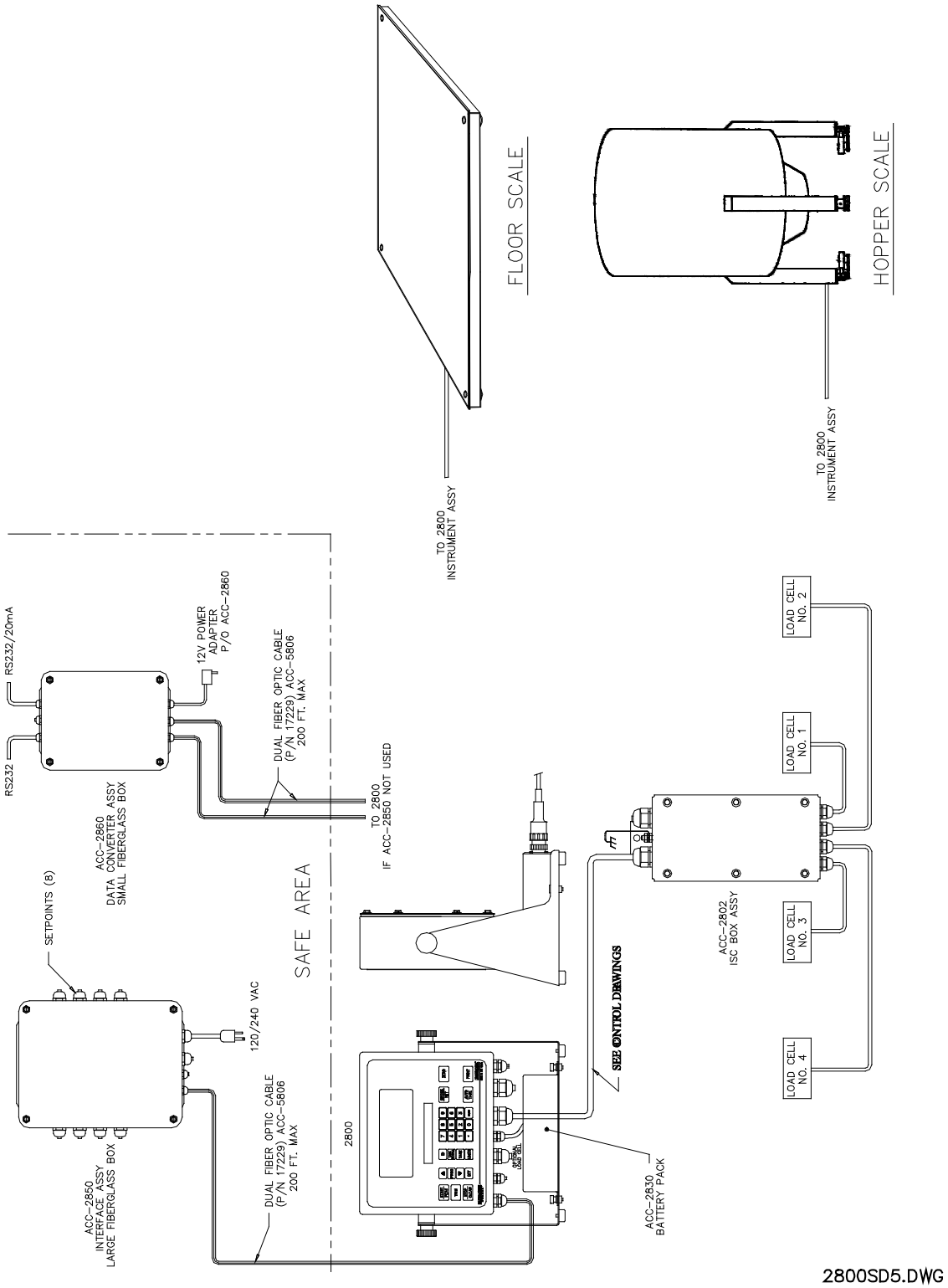
Avoid applying excessive force, repetitive bending, and dropping.

Precautions Against Chemical Environmental Factors

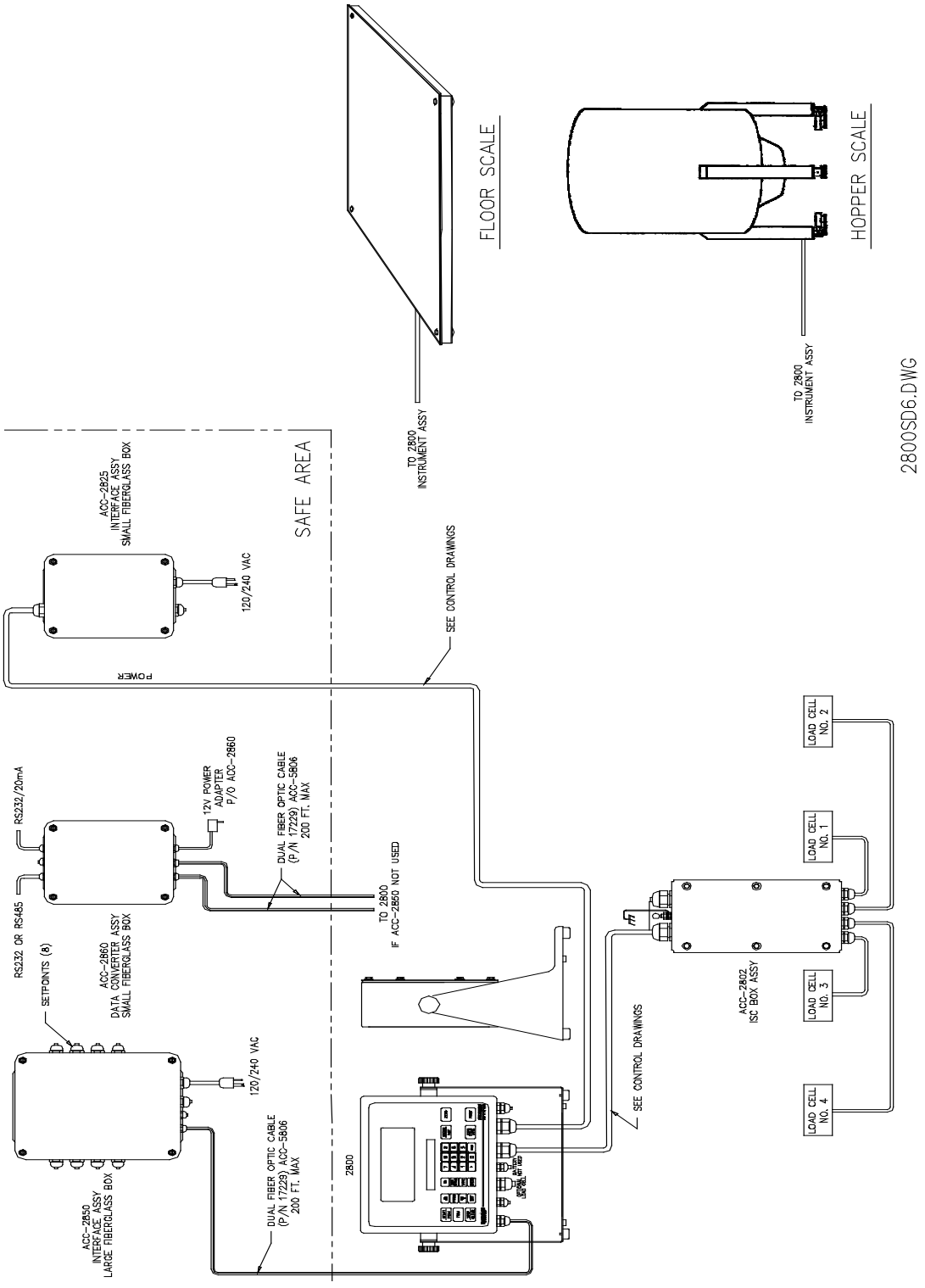
Do not bring the Optical Fiber into contact with plasticizers (Phthalate, etc.) and or soft PVC material including electric wire jacket, vinyl tape etc., otherwise the optical characteristics may deteriorate.

Do not bring the Optical Fiber into contact with detergents, adhesives, oils, solvents and other chemicals, the optical characterizes may deteriorate.

1.4. TYPICAL SYSTEM LAYOUT #1



1.5. TYPICAL SYSTEM LAYOUT #2



Section 2: Operation

2.1. CUSTOMER/ OWNER RESPONSIBILITIES

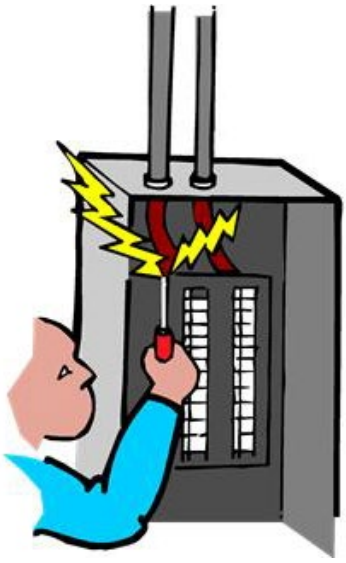
It is the customer/ owners' responsibility to maintain, the platform, instrument, and peripheral accessories in good order, and to protect the equipment from accidental or malicious damage.

The installation shall be in accord with the manufacturer's instructions and with the **National Electric Code (ANSI-NFPA 70).**

- Refer to **ANSI/ ISA-RP12.6, Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations** for guidance on the installation of intrinsically safe apparatus and systems.

Please follow these guidelines .

- ✓ **Do not break the seals on the instrument or attempt any internal adjustments.**
- ✓ **Absolutely no physical, electrical, or program modifications other than the 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 and etc.) are allowed.**
- ✓ **No service, repairs, or adjustments, other than those outlined in this manual, may be performed by untrained service personnel.**

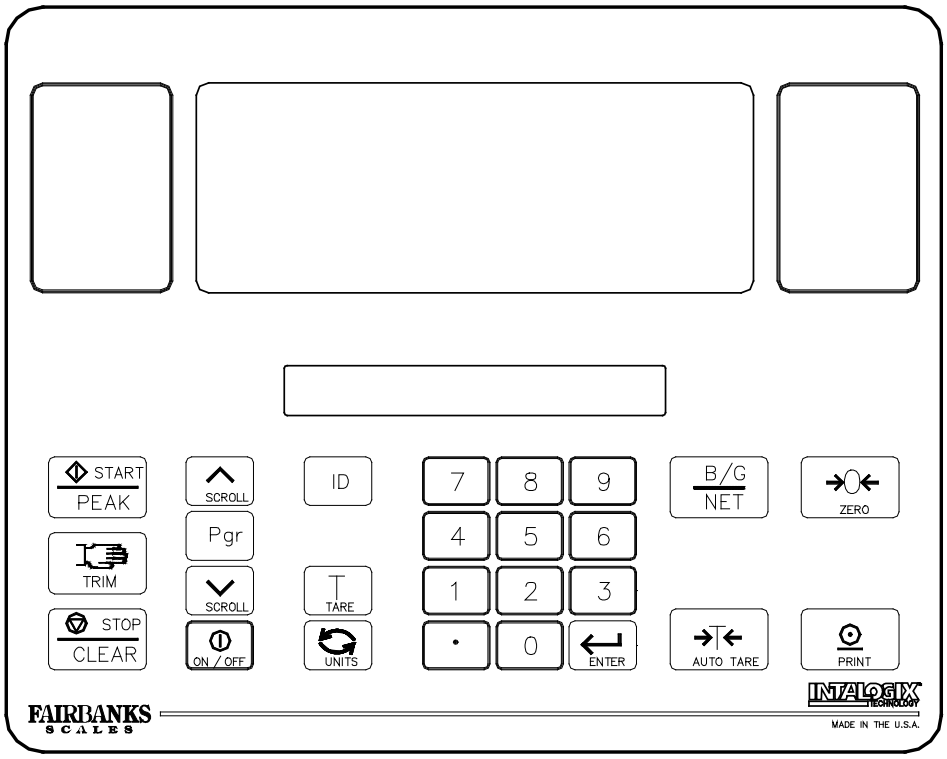


2.2. SAFETY

As is in the case with any material handling equipment, certain safety precautions must be observed during operation.

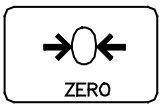
- ✓ **Never load the scale platform beyond its rated capacity.**
  - Refer to the rating on the serial number plate to be certain.
- ✓ **Ensure that any structure which supports the platform is capable of withstanding the weight of the platform plus its rated capacity load.**
- ✓ **Do not load the scale platform if there is any evidence of damage to the platform or supporting structure.**
- ✓ **Use safety chains or other suitable restraining devices if there is any possibility of the load shifting, falling, or rolling from its position on the load receiver.**

2.3. Front Panel Key Functions



The function of the front panel keys varies depending on the mode in which the instrument is operated. This Subsection defines the operation of each front panel key when in the weighing mode.

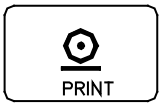
ZERO KEY



When in the Gross mode, this key sets the **Gross Weight** to Zero.

- If motion exists, the **ZERO** command will not be executed.
- If the weight on the platform exceeds the zero limit, and the **ZERO key** is pressed, the Zero command will not be executed.

PRINT KEY



Used to transmit weight data to an external device.

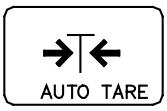
GROSS/NET KEY

Toggles between the Gross and Net Weight modes.

- It is also used to exit programming.

2.3. Front Panel Key Functions, Continued

AUTO TARE



In the Gross or Net mode, this key sets Tare Memory equal to the Gross Weight on the platform.

- The instrument displays "**0**" weight and enters the Net Weigh mode.
- The NET Legend displays.
- Auto Tare only operates if the Gross Weight is positive.

ID KEY

Enters numeric ID for printer or computer printout.

- A maximum of six digits is available, 0 thru 999999.

TARE KEY

Displays the currently entered **Tare Value**.

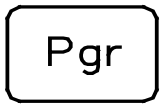
UNITS KEY

Toggles the displayed weight between the units selected in the **Configuration Program** (i.e. lb to kg or kg to lb.)

SCROLL KEYS

Moves through the Programming Menu Tree in an **UPWARD** or **DOWNWARD** direction.

PROGRAM KEY



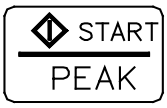
Enters into the instrument's Programming mode.

ON/OFF KEY

- Turns instrument **ON** or **OFF.**
- If the **Sleep Function** is selected, this key either disables or enables the **Sleep** mode.

2.3. Front Panel Key Functions, Continued

START/PEAK KEY



- Initiates a Setpoint Operation.
- Also enables Peak Net Tracking (PNT).

TRIM KEY

- Overrides the Setpoint Cycle.
- Adds weight in touch-controlled increments.

STOP/CLEAR

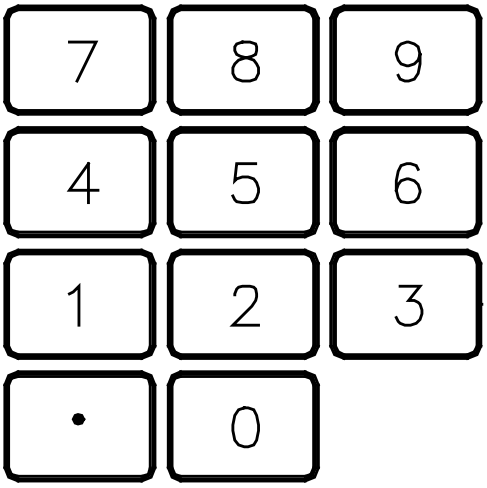
- Terminates a Setpoint Cycle.
- Resets the memory of the Peak Net Capture to a null value until a new Peak Net Weight is captured.

ENTER

- Inputs commands to the Setpoint Operation.

NUMERIC KEYS (0 THRU 9)

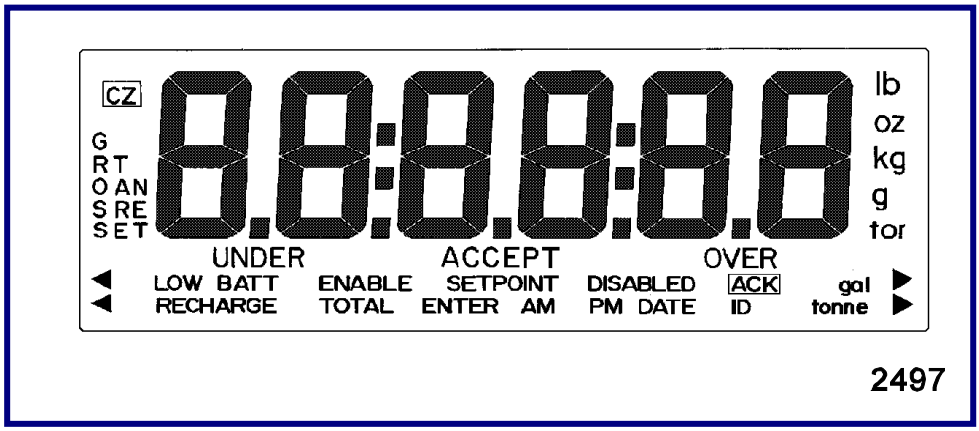
Used for numeric entries, such as Tare, ID, Setpoint Values, etc.



LCD DISPLAY

Displays weight on the load receiver and applicable prompts.

2.3. Front Panel Key Functions, Continued



2.3.1. LEGENDS

- Several different legends display on the LED screen.
- While most are self-explanatory, the following items are defined.

CZ (Center of Zero).

RECHARGE

- Battery power is low and will require recharging soon.
- The RECHARGE legend displays when the input voltage from the Battery Accessory 2830 falls below a threshold of approximately 5.4VDC when using Accessory 2802, or 5.32VDC when using Accessory 2880.

C A U T I O N

Battery surfaces get very HOT during recharging.

2.3.1. Legends, Continued

LoBAtt

Battery requires immediate recharging.

The **RECHARGE** legend disappears and the instrument automatically shuts down and displays **LoBAtt** when the voltage from the battery falls below the following:

- **5.3VDC** when using Accessory **2802**
- **5.12VDC** with Accessory **2880.**

C A U T I O N

Batteries which measure below **4.0 VDC** **must not be charged** *with the* **ACC 2840** *or* **ACC 2841 chargers**, *or damage to the charger and/or battery may occur.*

2.3.2. Instrument Weighing Functions

Three terms which describe the distribution of an object's weight are GROSS WEIGHT, TARE WEIGHT, and NET WEIGHT.

TARE WEIGHT

Tare weight is the weight of the incidental materials, such as its container.

NET WEIGHT

Net weight is the weight of only the primary materials.

2.3.2. Instrument Weighing Functions, Continued

GROSS WEIGHT

Gross weight is the total weight of a weighment.

- This includes any primary and incidental materials comprising the total weighment.

TARE WEIGHT VALUE + NET WEIGHT VALUE = GROSS WEIGHT

A Working Example

A can of house paint is an object to be weighed. The can is the incidental material used to hold the primary material, paint, and the label is incidental material used to identify the paint. All the incidental materials summed together comprise the Tare weight. All the primary materials weights summed together comprise the Net weight; in this case pigment, base, and solvent. The object is made up of incidental materials, can and label, and primary material, paint. Summed together, the complete object is the Gross weight.

GROSS	=	NET	+	TARE
TARE =	GROSS	–	NET	
NET	=	GROSS	–	TARE

NET = GROSS - TARE is particularly important because it is what a scale uses to compute net weights in the NET WEIGHING mode.

Gross Weight is a function of the total weight on the platform from the zero reference.

Tare Weight is always an operator defined value.

2.3.3. Gross Weighing

1. Press the B/G NET key to select **Gross** as indicated by the legend.

2. With the platform empty, press the ZERO key.
   - The display indicates **ZERO**.
   - The Center-of-Zero (**CZ**) legend appears.

3. Place the object to be weighed on the scale platform.
   - The weight of the object displays.
   - The instrument is only able to measure the weight on the platform.
   - The instrument can not 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 weighed by pressing the ZERO key.
   - The instrument will assign whatever weight happens to be on the platform a zero weight value.
   - Starting with an empty platform is not required.
   - The key sets the display to "**0**", regardless of what is on the platform.

   - Weighing in the **Gross** mode consists of pressing the ZERO key and placing a weight on the platform.
   - The display shows the Gross Weight of the object.
   - The instrument understands Gross Weight as the total weight placed on the platform after the ZERO key is pressed.

2.3.4. TARE WEIGHTS

Tare weight is operator-defined. There are two methods to input a tare weight value.

Keypad Tare Entry

Assign the tare weight value using the numeric keypad, then press the ENTER key. The instrument will change to the Net Weighing mode, and display the Gross Weight less the Keypad Tare weight entry.

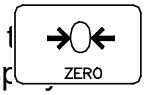
2.3.4. Tare Weights, Continued

Auto Tare Entry

Place the item(s) that will comprise the Tare weight onto the scale and press the key. The instrument will Change to the Net Weighing mode, and display the Gross Weight less the Auto-tare weight entry. The tare weight value remains unaltered in the instruments memory until the following occurs.

1. Power is removed.
2. The key is pressed.
3. A new tare weight is entered via the keypad.
4. The **Program Menu** is accessed.
   - If the value of the tare weight entered using the keypad does not correspond with an exact division size, the number is first truncated to the correct decimal location, and then rounded to the nearest division size.
   - For example, for a division size of 0.1, an entered tare of 2.19 is truncated to 2.1. It is then rounded to a final tare of 2.1.
   - For a division size of 20 an entered tare of 511 will be truncated to 510 and then rounded to a final tare of 520.
5. Correct entry errors by inputting "0's" until a single "0" is displayed
6. Press t  key.

Net Weighing Using AUTO TARE

1. Press t  key. The display will read "0" and the GROSS Legend will be disp

2. Place the empty container on the platform.
3. Press t  key.

   - The scale displays "0" and the NET legend is also displayed. The weight of the container on the scale will be entered in to the instruments memory as a TARE weight value.

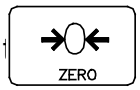
2.3.4. Tare Weights, Continued

4. Place the material to be weighed in the container. The display will show the weight of the material that is in the container. This is the NET weight value.

NOTE: *Net weighing of pre-packaged containers can be accomplished by first placing an empty container that is the same weight as the product container on the platform, and pushing* 

before beginning weighing operations.

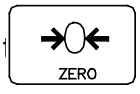
Batching Using AUTO TARE

1. Select the **GROSS Mode** and place the empty container on the platform.
   - the **TARE Weight** of the container is displayed.
2. Push the 

key.
3. Fill the container with the first item until the desired weight is achieved. Instrument display indicates the net weight of the first item (in the **GROSS mode**
4. Push the 

key to reset the display to zero.
   - The instrument display indicates zero net weight.
5. Place the next item into the container until the desired weight is reached.
6. Repeat Steps 4 and 5 until all items have been put into the container.
7. Switch to the **GROSS Mode** and read the total NET weight of the batch.
8. Repeat Steps 1 through 7 for other batches.

Follow these steps to clear the operation.

1. Select the **GROSS mode**.
2. Remove all materials from the platform.
3. Push the 

key to zero the display.
4. Push the 

key to reset the tare memory.
5. Select the **GROSS mode.**

2.3.4. Tare Weights, Continued

ENTERING ID Numbers

1. Place the instrument into the Weighing mode.
2. Press ID key.
   - The current ID number or id none will be displayed.
3. Use the numeric keypad to assign an ID number.
   - A maximum of six digits, 0 through 999999.
4. Press ENTER key to save the displayed ID number and to return the instrument to the Weighing mode.
   - The ID number is printed as part of each print cycle if selected in the **IO Output Programming.**

Peak Hold Function

The **PEAK HOLD** (**P hoLd**) function is used to determine, display, and print the largest Net weight data achieved during a weighing cycle. A weigh cycle ends when the Print command is given, or when the peak Net weight is manually cleared by the **CLEAR** key. **PEAK HOLD** tracks only Net weight, and operates independently of the display. The peak weight can either be a positive or a negative number, determined by the absolute weight value. This means that if a positive peak is displayed, a negative weight value of greater absolute value could update the peak information in the same cycle.

If the **P hoLd** option is activated in the **IO Menu**, then pressing the **START** key enables this function

- It allows the viewing of the current peak net weight.

Pressing **ENTER** returns the display to the **Weighing mode**.

- The **P hoLd** feature works in the **Gross** or **Net Weighing modes**.

1. Place a container on the scale.
2. Press the **AUTOTARE** key, or enter in a known **TARE Weight.**
3. Press the **START/PEAK** key to view the current **Peak Net Weight.**
4. Press the **ENTER** key to enable the feature and return to the **Weighing mode.**
5. Perform the desired number of weighment'.

2.3.4. Tare Weights, Continued

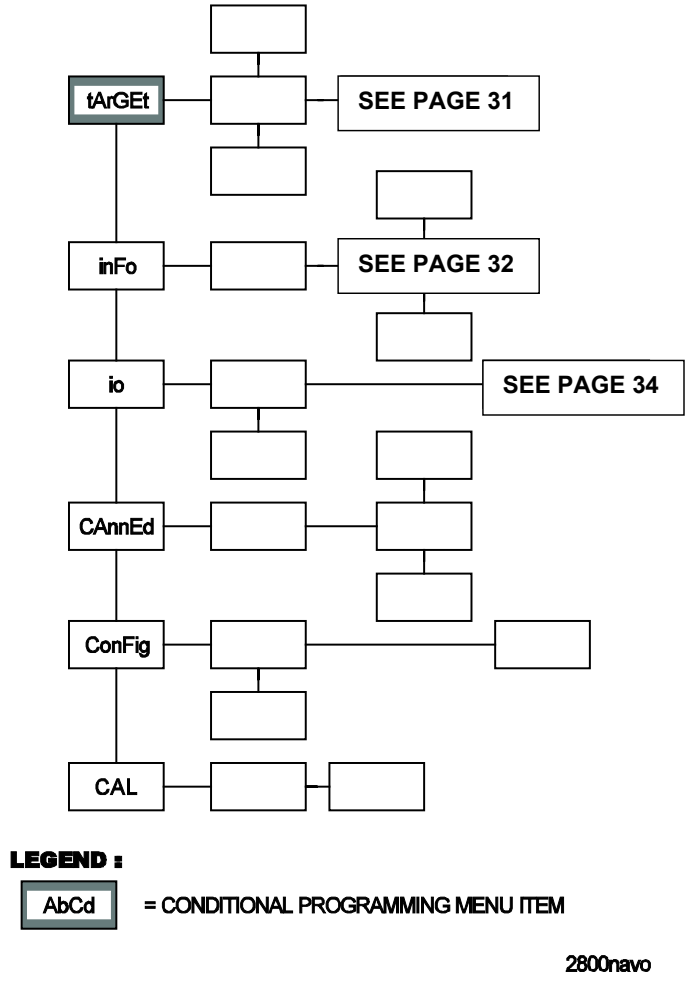
- At any time, the current **Peak Net Weight** can be viewed by pressing the **START/PEAK** key.
- Press the **ENTER** key to return the **Weighing mode**.

6. If a printer is enabled, pressing the **PRINT** key will have the **Peak Net Weight** transmitted with the printed data.
   - A print command ends the "**Peak hoLd" Weighing Cycle**.
7. Press the **STOP/CLEAR** key to reset the current **Peak Weight**, and press the **START/PEAK** key followed by the **ENTER** key to enable the feature.

Section 3: Programming

3.1. Menu Navigation

The instrument must be programmed before it can be used. The program is arranged in a menu tree format. Once the Programming mode is entered, menu's may be accessed in any order by following the flow charts on the following pages.



The graphic model shows the **Main Menu Tree** options and several levels of sub-menu options. On the following pages, menus are displayed graphically starting with a specific main menu option, its sub-menu's, and ending with the data within each that can be selected and saved. Each graphic shows lines as the paths to follow while navigating the menu.

3.1. Menu Navigation, continued

Keys Used for Navigation

The **SCROLL** keys are used to navigate through menu options or data in an **UPWARD** or **DOWNWARD** direction. Continually pressing either **SCROLL** key cycles through the available options.

The **ENTER** key accepts and/or stores the displayed option or data entry. Press **ENTER** at a menu option to access the sub-menu's and data contained in that option. In the following flow charts, Enter is expressed as a lateral navigation key.

The **B/G NET** key exits most programming menu's returning to the previous menu. Continually pressing the **B/G NET** key exits programming and returns to the Weight Screen. In the following flow charts, **B/G NET** is expressed as a lateral navigation key.

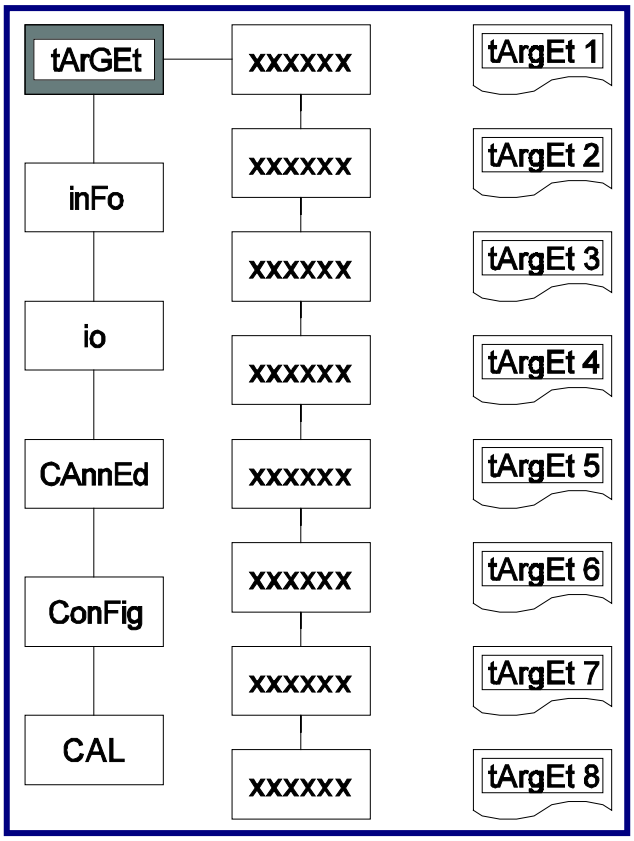
Main Menu Descriptions

MENU ITEM	DESCRIPTION
tArgEt	• Conditional statement that appears if the setpoints are active. • No password is required. • Allows the operator to set target weights as defined by Setpoint mode. • See page 29 further details.
info	• No password is needed. • Displays instrument data. • Prints Audit Reports. • See page 30 for further details.
io	• **"U" Code** is required,. • Sets the time and date. • Programs all I/O Ports for printers and other accessory devices. • See page 32 for further details.
U CodE (User Code)	Used by an operator to access the IO Menu.
CAnnEd	Not operator accessible.
ConFig	Not operator accessible.
CAL	Not operator accessible.

3.2. Target Menu Description

This area is for the numeric entry of target weights by the operator.

- No sub menu selections are available.
- Note that the **Status Display** shows the current setpoint being programmed.



1. Use the **SCROLL** keys to select the setpoint to be programmed.
2. Key in the desired target weight using the numeric keypad including the decimal point, if applicable.
3. Press the **ENTER** key.
4. When all applicable setpoints have been programmed, press the **B/G NET** key.
   - The **STORE** displays.
5. **OPTION A**

   If the **ENTER** key is pressed, the display will indicate **STORED** momentarily and then **TARGET**. Pressing **B/G NET** again will exit to the weigh screen.

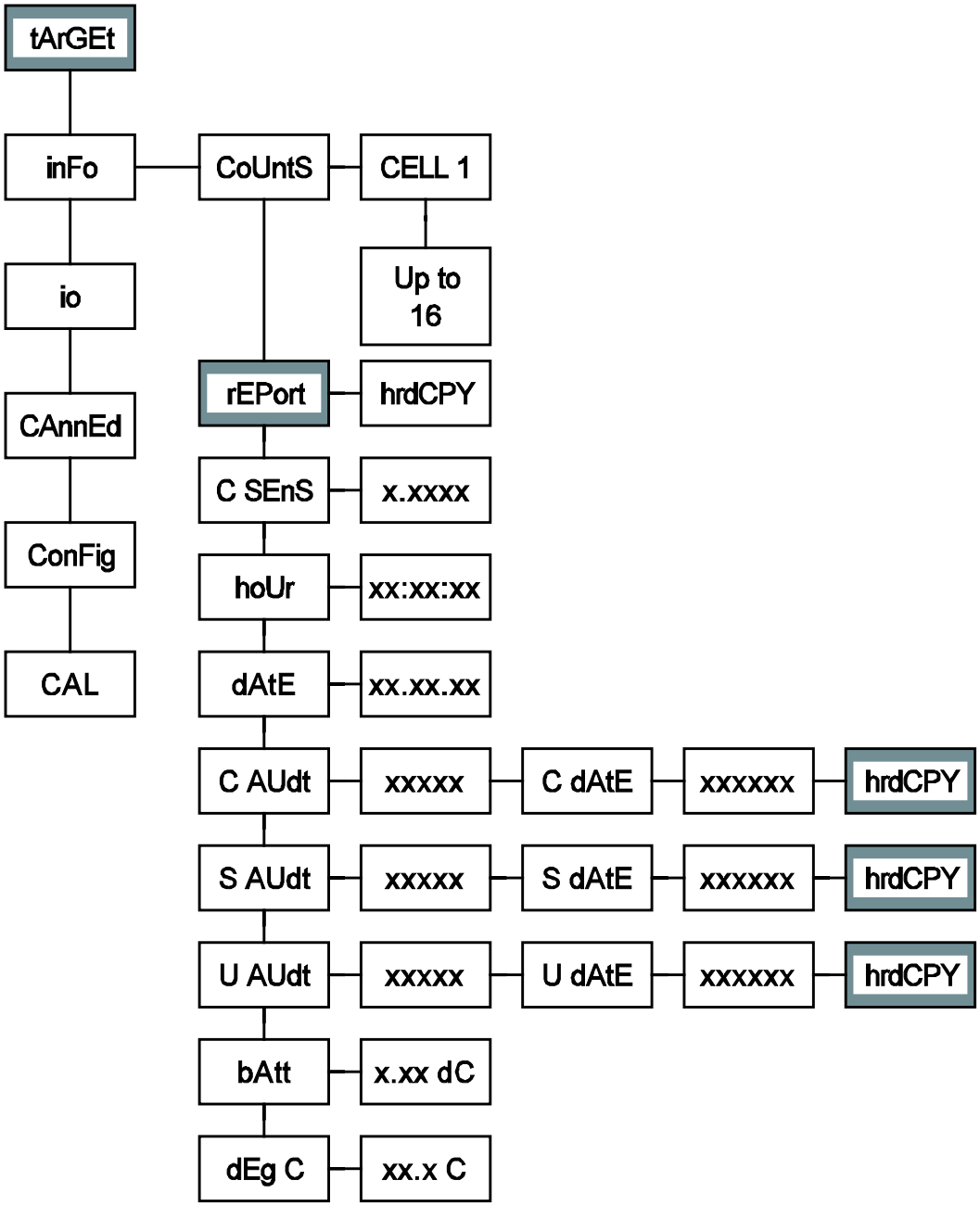
   OPTION B

   If the **SCROLL** key is depressed, it will toggle between **STORE** and **CANCEL**.
   - The **CANCEL** prompt gives the operator the option of exiting without saving changes.
6. Select **CANCEL** and press the **ENTER** key, the display will show **TARGET**.
7. Pressing the **B/G NET** key will exit to the weigh screen.

3.3. Info Menu Description

The info menu is user accessible ***without a security code.*** This menu may be checked by **Weights & Measures** to view the **S Audt**, **U Audt**, or

C Audt entries, or the operator, service technician for diagnostic and informational purposes. This menu contains the following menu selections.



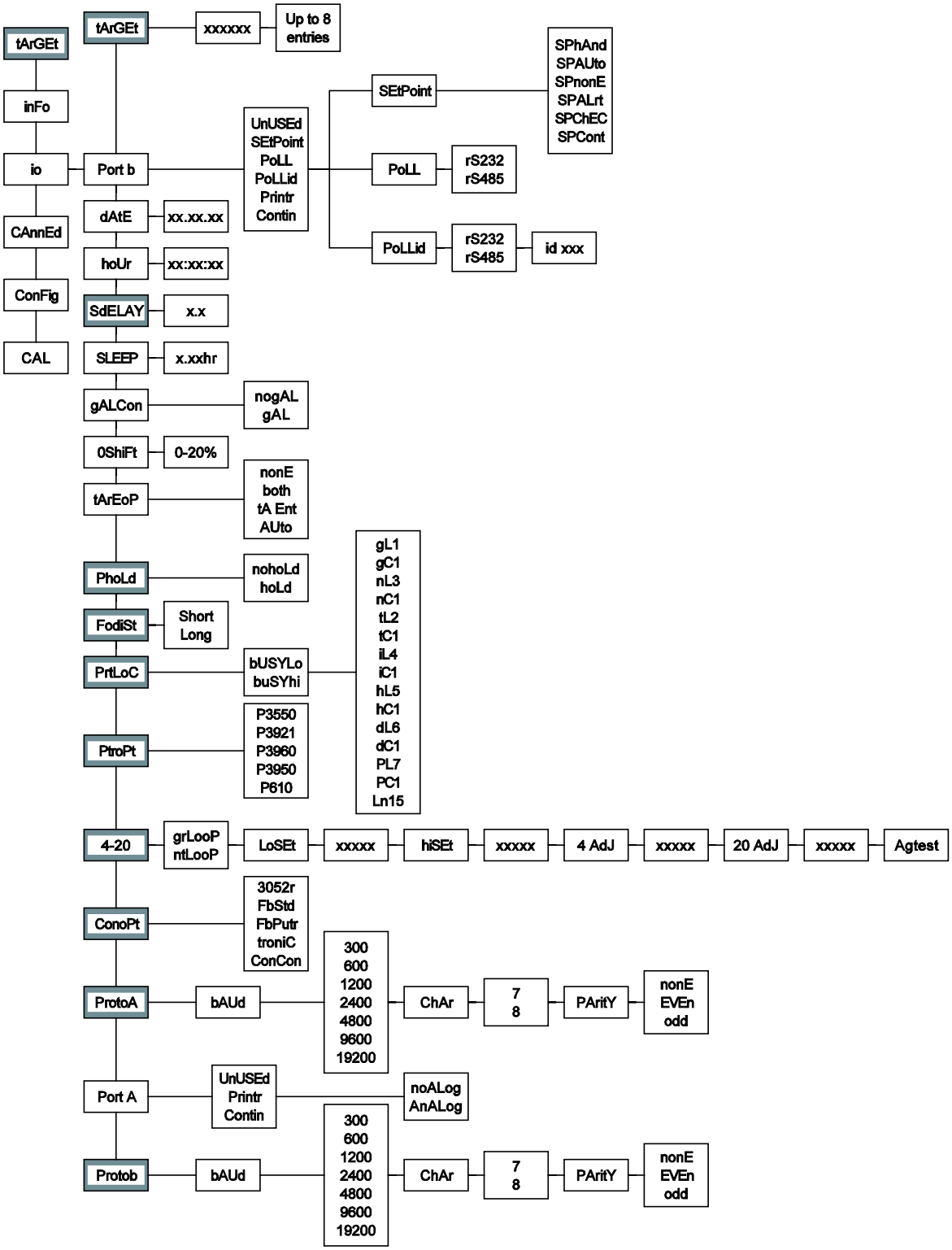
3.4. Main Menu Descriptions

MENU ITEM	DESCRIPTION

CoUntS	• Formatted **CELL X**, where x represents the load cell currently being displayed, the load cells are selectable using the SCROLL key.
	• The small display shows two numeric values.
	  • The first value is the Initial Deadload or Zero Counts.
	  • The second is the Current Liveload Count(s).

dEg C	• Formatted **XX.X°C.** • Displays the current internal temperature of the instrument in Centigrade.
bAtt	• Displays **XX.XdC.** • The current battery voltage.
U AUdt	User Audit.
S AUdt	Service Audit.
C Audt	Calibration Audit.
dAtE	• Displays **MM.DD.YY**. • The current system date.
hoUr	• Displays **HH.MM.SS.** • The current system time. • For viewing purposes only. • Refer to the **IO Section** for programming.
C SEnS	• mV/V of cell(s) currently selected. • All cells may be viewed using the **SCROLL** key.
rEPort hrdCPY	• For printing a configuration report to an installed printer. • A conditional statement appearing only when a printer is installed on **IO Ports A** or **B.**

3.5. I/O Menu


tArGEt
inFo
io
CAnnEd
ConFig
CAL
tArGEt
xxxxxx
Up to 8 entries
Port b
UnUSEd
SEtPoint
PoLL
PoLLid
Printr
Contin
SEtPoint
SPhAnd
SPAUto
SPnonE
SPALrt
SPChEC
SPCont
PoLL
rS232
rS485
PoLLid
rS232
rS485
id xxx
dAtE
xx.xx.xx
hoUr
xx:xx:xx
SdELAY
x.x
SLEEP
x.xxhr
gALCon
nogAL
gAL
0ShiFt
0-20%
tArEoP
nonE
both
tA Ent
AUto
PhoLd
nohoLd
hoLd
FodiSt
Short
Long
PrtLoC
bUSYLo
buSYhi
gL1
gC1
nL3
nC1
tL2
tC1
iL4
iC1
hL5
hC1
dL6
dC1
PL7
PC1
Ln15
PtroPt
P3550
P3921
P3960
P3950
P610
4-20
grLooP
ntLooP
LoSEt
xxxxx
hiSEt
xxxxx
4 AdJ
xxxxx
20 AdJ
xxxxx
Agtest
ConoPt
3052r
FbStd
FbPutr
troniC
ConCon
ProtoA
bAUd
300
600
1200
2400
4800
9600
19200
ChAr
7
8
PAritY
nonE
EVEn
odd
Port A
UnUSEd
Printr
Contin
noALog
AnALog
Protob
bAUd
300
600
1200
2400
4800
9600
19200
ChAr
7
8
PAritY
nonE
EVEn
odd

3.5.1. I/O Menu Descriptions

The IO (Input/Output) Menu sets up communications for sending data to devices, such as computers, printers, or remote displays. It also contains a menu for setting the time & date.

MENU ITEM	DESCRIPTION
Port b	Programs Setpoint modes, remote displays, printer, and computer outputs.
dAtE	Adjusts the date.

Steps for Setting the Date

1. With **dAtE** displayed, press the **ENTER** key.
   - The present date in memory displays with a small legend date flashing .
2. Using the numeric keypad, enter the current date.
   - Use the **MM/DD/YY** (month/day/year) format.
3. Press **ENTER**.
   - Once complete, the display returns to the **dAtE**.

MENU ITEM	DESCRIPTION
hoUr	Adjusts the time.

Steps for Setting the Time

- With **hoUr** displayed, press the **ENTER** key.
- The present time in memory displays with a small legend time flashing.
- Using the numeric keypad, enter the current date.
- Use the **HH/MM/SS (**hour/minute/second) format.
- When entering the time of 08:35am for example, press the numeric keys **0, 8, 3, 5**, followed by the **AUTOTARE** key.
- The time 08:35A.
- The **AUTOTARE** key is used to enter an **A** for AM.
- The **PRINT** key is used to enter **P** for PM.
- For military time (24 hour format), enter the current time using the numeric keypad and press the **ENTER** key.

3.5.1. I/O Menu Descriptions, Continued

MENU ITEM	DESCRIPTION
SdELAY	Activates the **Sleep Delay mode** in minutes and/or seconds *between* ingredients in a batch file of selected setpoints if the **Auto Batch mode** is on.
SLEEP	The **Sleep Delay** adjusts the length of time the instrument is inactive before going to sleep. • **0.00 hr** or **X.XX hr** (hrs & min) is displayed. • Use the **SCROLL** keys to adjust as required. • A setting of **0.00** hr disables the **Sleep Function**.

NOTE: *The* **Sleep mode** *will not activate if* **Recharge** *displays. The* **Sleep mode** *will also not occur when in the* **SPAUto** *or* **SPhAnd** *modes if relays are energized.*

EXAMPLE

MENU ITEM	DESCRIPTION
gALCon	**Weight-to-Gallons** Conversion Option. When **Gallon** is selected, the **UNITS** key toggles the display from weight unit to gallon units.

4. In the **Gross Weigh mode**, note the displayed amount.
5. Press the **UNITS** key to toggle to the **Gallons** (GaL) display.
   - The number of gallons displays.
6. Press the **TARE** key to adjust the number of gallons.
   - The amount displays (**Gallons Factor**).
7. Press any numeric key.
   - A UCoDE window displays.
8. Enter the code using the numeric keypad.
9. Press **ENTER**.
   - The current date flashes in the display.
   - "**Entering Gallons**" also displays.

3.5.1. I/O Menu Descriptions, Continued

10. Press **ENTER** again.
    - The current gallon per weight displays.
11. Clear the display by pressing the numeric **ZERO** key until it is blank.
12. Key in the correct number of gallons.
13. Press **ENTER**.
    - The amount of gallons displays.
14. Press the **UNITS** key to toggle from weight to Gallons and confirm the correct weight to gallons ratio.

NOTE: *The* **Tare Mode** *is unavailable in* **Gallon Conversion Mode.**

MENU ITEM	DESCRIPTION
0ShiFt	Sets the Capacity Percentage of the Positive Weight Shift on the scale. • Zeros the scale before an error code (i.e. lc error) displays in the small window display. • Press the **ZERO** key a second time zeros the scale and continues its weighing.
tArEoP	Tare options include AUto (Using the **AUTOTARE** key).
tA Ent	Using the numeric keypad, enter a known Tare Weight.
P hoLd	Peak Weight options are Hold and No-Hold. • If enabled, this holds the highest recorded **NET Weight Reading.** • Not used while in the Setpoint mode.
FodiSt	If a Device Output is selected, there are two fiber optic distance options. • 0-99 ft. = Short • 100+ ft. = Long
PrtLoC	Formats all available printer locations, if a ticket printer is selected in either port. The following prompts apply when formatting the printer.

3.5.1. I/O Menu Descriptions, Continued

NOTE: *The references to* **Line** *are as seen from the top of page down, and the* **Column** *is equal to one character space width.*

PROMPT	COMMENT	CHOICES
bUSYh	Busy Line	bUSYhi, bUSYLo
gL 1	Gross Line	
gC 1	Gross Column	
nL 3	Net Line	
nC 1	Net Column	
tL 2	Tare Line	
tC 1	Tare Column	
iL 4	ID Line	
iC 1	ID Column	
hL 5	Hour (Time) Line	
hC 1	Hour (Time) Column	
6	Date Line	
dC 1	Date Column	
PL 7	'Peak' Line (if enabled)	
PC 1	'Peak' Column (if enabled)	
Ln 15	Length (Total Lines Printed)	
no Leg	Legend/No Legend	no LEg, grtAnt

EXAMPLE

Using the basic format below, to place time and date on the same line requires the following settings.

- **hL5**
- **hC1**
- **dL5**
- **C15**

NOTE: **Peak Net Weight** *must be printed to a* **GTN format**.

3.5.1. I/O Menu Descriptions, Continued

MENU ITEM	DESCRIPTION
PtroPt	Selects the printer type. • Options include **P220**, **P3550, P3921, P3960, P3950, P610, P3921**.
4-20	Sets the **4-20 Analog Output**.

NOTE: *The* **4-20mA Output** *is enabled by selecting* **AnALog** *in* **Port A.**

C A U T I O N

The 4-20ma accessory is a passive device!
The power is to be supplied by others, and *MUST BE*
a *DEDICATED* and an *ISOLATED* power supply.

MENU ITEM	DESCRIPTION
4-20 •	• **grLooP**: Tracks the **GROSS Weight**. • **ntLooP**: Tracks the **NET Weight**.

PROM Version 6.2+ Notes

- The 4-20mA output remains locked on the last reading at the time the **PGR** was pressed.
- An **Overload (oL)** condition produces a reading of **24mA.**
- An **Underload (UL)** condition produces a reading of **3.5mA.**
- While in the **Sleep mode**, the 4-20mA produces a reading of 3.5mA, and it is not tracked until the instrument is re-activated.

3.5.1. I/O Menu Descriptions, Continued

<table>
<tr><th>PROMPT</th><th>COMMENT(S)</th></tr>
<tr><td>LoSEt</td><td>
• Sets the weight value associated with 4mA.
• Usually "0".
1. At the LoSEt prompt, press ENTER.
2. Use the numeric keypad to enter desired weight value.
3. Press ENTER.
</td></tr>
<tr><td>hiSEt</td><td>
• Associated weight value of 20MA.
• Usually the capacity of the scale.
1. Press ENTER at the hiSEt prompt.
2. Use the numeric keypad to enter the desired weight value.
3. Press ENTER.
</td></tr>
<tr><td>4 AdJ</td><td>Press ENTER to display a current number representing the 4mA Output.
• See note on key functions.</td></tr>
<tr><td>20 AdJ</td><td>Press ENTER to display a current number representing the 20mA Output.
• See note on key functions.</td></tr>
<tr><td>AgtESt</td><td>
• LP4 - TO - LP22.
• Press ENTER to perform an analog test.
• 4mA thru 22mA will be output momentarily in 2mA steps.
When adjusting either 4mA or 20mA, the following numeric keys increase or decrease the reference value in the fashion that follows.
<table>
<tr><th colspan="2">Increased by:</th><th></th><th colspan="2">Decreased by:</th></tr>
<tr><td>9</td><td>10,000</td><td></td><td>4</td><td>10,000</td></tr>
<tr><td>8</td><td>1,000</td><td></td><td>3</td><td>1,000</td></tr>
<tr><td>7</td><td>100</td><td></td><td>2</td><td>100</td></tr>
<tr><td>6</td><td>10</td><td></td><td>1</td><td>10</td></tr>
<tr><td>5</td><td>1</td><td></td><td>0</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>ConoPt</td><td>Used for Continuous Output.
Choices include the following:
• 3052r • FbStd • FbPUtr • troniC • ConCon</td></tr>
<tr><td>ProtoA</td><td>Protocol setting for Port A choices include selections for the following:
• bAUd 9600, 600, 1200, 2400, and 4800
• ChAr 8 and 7
• PAritY nonE, odd, and EuEn</td></tr>
</table>

3.5.1. I/O Menu Descriptions, Continued

PROMPT	COMMENT(S)
Port A	Port A has available selections of the following: • **UnUSEd** - no outputs • **Printr** - printer output • **Contin** - continuous output
noALog, AnALog	Used to turn on or off the 4 - 20MA output. • **noALog** = Off • **AnALog** = On
Protob	Protocol setting for Port A choices include the following: • **bAUd 9600**, **600**, **1200**, **2400**, and **4800** • **ChAr 8** and **7** • **PAritY nonE**, **odd**, and **EuEn**

tArgEt	Conditional, if setpoints are selected in Port B.
	1. Press **ENTER** to adjust the Setpoint Target Weight Menu.
	  • The large display shows the Current Target Weight Value associated with the Target Number, as shown in the small display.
	  • The **SCROLL** key toggles through available Setpoint Relays (Targets).
	2. Enter a new Target Weight Value with the numeric keypad.
	3. Press **ENTER** to accept the new weight value and advance to the next available target.

Port b	Port b can be configured for the following: • **UnUSEd** - no outputs • * **SEtPnt** - Setpoint modes • * **PoLL** or **PoLL id** - computer output • **Printr** – printer • **Contin** - continuous output
Poll	• Used for Demand Output to a computer. • When the instrument receives an upper-case **"W"** followed by a **carriage return** (**"W", "Cr"**) from the PC, a data stream transmits. • See **Appendix VII** for ASCII Chart.
Poll id	• Use this demand mode when a specific instrument ID is required. • Setup by entering the required ID's decimal equivalent. • See **Appendix VII** for ASCII Chart.

3.5.1. I/O Menu Descriptions, Continued

EXAMPLE

The required ID is **3** (decimal equivalent is **51**).

1. Press the **ID** key.
   - Either **idnonE** or **the current ID** shows in the large display.
2. Using the numeric keypad, enter **51**.
3. Press **ENTER**.
   - When the PC sends **ID 3**, then a upper case **W** followed by a **C** carriage return (**3, W, Cr**), the instrument with that ID responds with a data transmission.

SEtPnt

The operation of Setpoint requires that accessories **5806 (Fiber Optic Cable)** and **2850 (Safe Area Relay Box)** be installed. There are five modes of setpoint operation that may be selected from during the installation and programming by your local Fairbanks Service Center or Authorized Factory trained Distributor.

SEtPnt Modes

PROMPT	CHOICE(S)
SPCont	• Continuous operation of setpoints, **ON** at entered target weight. • *MUST* press **START** to begin function.
SPChEC	• Check weighing, such as **UNDER/ACCEPT/OVER**, with setpoint Relays 1 and 2 active for alarms.
SPALrt	• Setpoint **Relay 8 is active**, used as both **LOW** and **HIGH** alarms in **SoLo mode**. • Or Relays 4 and 8 if in **Paired** mode.
SPAUto	• Automatic batching, a range of materials can be added one at a time to complete a batch. • **SPAUto** *will not function* when in the **Gallons mode.** • When configuring **SdELAY**, to perform the delay in minutes and seconds ***between*** ingredients, the setting is located in the main **I/O Menu.**
SPhAnd	This operation requires a manual **START** at each setpoint.

3.5.1. I/O Menu Descriptions, Continued

TARGET MENU

PROMPT	CHOICE(S)
tArgEt	• Used for programming weight values associated with setpoint-relays. • **Target 1 = relay 1** and **Target 2 = relay 2**, through rest of programmed setpoints. • The number of targets will vary depending on number selected during initial setup. Modifications should be performed with caution. • The **Setpoint mode** determines the target function, and targets should be programmed accordingly.

SEtPnt MODE

Target Assignment

PROMPT	CHOICE(S)
SPCont	• **Target 1 thru X** (where X is the total number of setpoints) are the programmed number of setpoint relays. • Single-value relays that energize when their assigned weight value is reached or exceeded. • These relays, as a group, are manually controlled by the **START** and **STOP** front panel keys. • No **Autoprint** available in this mode.
SPChEC	• In the **Check Weigh** mode, Target 1 is the **UNDER** range setpoint-Relay 1. • It is on-active if the weight is equal to or below its assigned weight value. • Target 2 is the **OVER** range setpoint-Relay 2. • It is **Active** when the weight is equal to or above its assigned weight value. • The **ACCEPT** range is the weight between **UNDER** and **OVER**. • It is selected to operate either the **Gross** or **Net** modes.

NOTE:

- *The legends for* **UNDER, ACCEPT**, *and* **OVER** *show on the large display when its associated weight value is active.*
- *There is not a relay output for the* **ACCEPT** *range.*
- *When using the* **SPCont** *or* **SPChEC** *modes the relays respond to the absolute value displayed (***+/-***) in the* **Gross** *mode and to the positive value displayed in the* **Net** *mode.*

3.5.1. I/O Menu Descriptions, Continued

PROMPT	CHOICE(S)
SPALrt	• Used for **ALARM** purposes. • In the SoLo **mode** only Relay 8 is used, for both the LOW and HIGH alarm. • In the paired mode, Relays 4 and 8 are used. • The setpoint-relay will be active when the **GROSS** weight is equal to or below the programmed **LOW ALARM** weight value or equal to or above the programmed **HIGH ALARM** weight value.

- The following applies to either of the **Setpoint Batch modes**, whenever the weight on the scale is below or above the **Alert Value**, and the **Alert** *is enabled*. The alert relay(s) toggle **On/Off** when the following occurs.
- The front panel keys are pressed.
- The instrument comes out of its Sleep mode.

The SPALrt targets are only programmable in the **IO Port B Menu.**

- The SPALrt may be used with all other setpoint modes except whenever **four (4)** paired setpoints are programmed.
- If SPALrt is enables in conjunction with any other setpoint option, the instrument prompts for **Alarm low wgt,** causing an **Alarm high wgt**.
- **Alarm IO** must be set to a value other than **zero.**

3.5.1. I/O Menu Descriptions, Continued

<table>
<tr><th>PROMPT</th><th>CHOICE(S)</th></tr>
<tr><td>SPAUto</td><td>
A Batching mode, allowing the operator to press the START key once to add multiple materials automatically

It allows SoLo (single setpoint-relay) or PAIRED (dual setpoint-relays) setpoint(s).
In the SoLo mode. Targets 1 thru X represent the required weight of each individual material.
In the PAIRED mode, Targets 1 thru 4 represent the Bulk or Fast-Fill Relays
Targets 5 through 8 are the slow or target.
Note the association of paired setpoints-relay:
1-5
2-6
3-7
4-8

Always program the Bulk-Fast Fill Setpoint-Relays to a lesser weight value than the complete material weight value

Configure the Target-Slow Fill Setpoint-Relays assigned to the complete material weight value.
When using multiple materials, set the SdELAY (timer for start of next material relays) in the IO Menu.
If a printer has been selected, an auto print occurs when target value is reached.
SPAUto is not available in the gallons mode.

SPAUto EXAMPLE
Below is an example of a simple, two (2) material batch with PAIRED relays.
<table>
<tr><th>FUNCTION</th><th>TARGET NUMBER</th></tr>
<tr><td>• Material 1 bulk - fast fill relay (1)</td><td>• 1</td></tr>
<tr><td>• Material 2 bulk - fast fill relay (2</td><td>• 2</td></tr>
<tr><td>• Not used</td><td>• 3</td></tr>
<tr><td>• Not used</td><td>• 4</td></tr>
<tr><td>• Material 1 target - slow fill relay (5)</td><td>• 5</td></tr>
<tr><td>• Material 2 target - slow fill relay (6)</td><td>• 6</td></tr>
</table>
</td></tr>
</table>

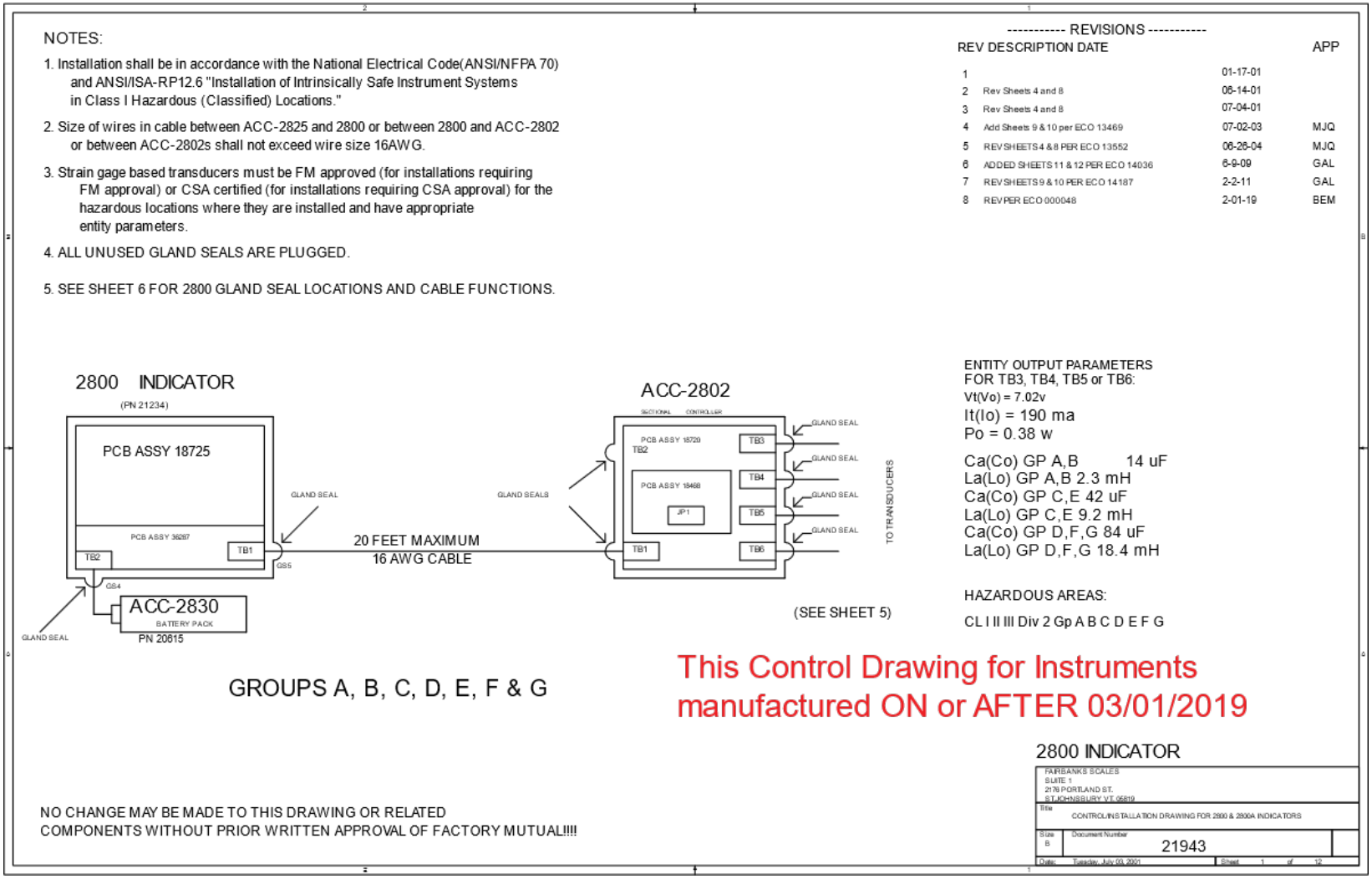
3.5.1. I/O Menu Descriptions, Continued

PROMPT	CHOICE(S)
SPhAnd	The **Manual mode** of a batching process. • Each separate material is operator-selected by using the **SCROLL** key, and then pressing **START**. • This sequence must be continued until the batch is complete. • If a printer is selected, an auto print occurs when target value is reached. • Further detailed programming includes the following in order to define this modes operation. • Gross (groSS) • Net (nEt) • Single relays (SoLo) • Dual relays (PAirEd) • Upweighing (UP) • Downweighing (not UP) • Down weighing is a net mode function and requires an initial weight of zero. The instrument ***must*** have an auto tare performed prior to beginning the setpoint operation. • **SPhAnd** is not available in the **Gallons mode.**
SPhAnd SPALrt	• Used for ALARM purposes. • Only setpoint-relay (8) is used for both the LOW and HIGH alarms. • The setpoint-relay actives when the **GROSS** weight is *equal to or below* the programmed **LOW ALARM** weight value, or *equal to or above* the programmed **HIGH ALARM** weight value. Set the **LAST** to the following value, if **Paired** is selected: PAIRED / LAST: 1 / 5; 2 / 6; 3 / 7; 4 / 8 Relays (4) and (8) are conditional on selection of the **SPALrt** feature.
EXITING MENUS	When exiting the **TARGET** or **IO** menus, either store or canceling the changes. • When prompted to SToRE, press **ENTER** to save the changes. • The display momentarily reads SToRED, and then returns to the root menu prompt. • With SToRE displayed, press the **SCROLL** key to select the CANCEL option • Press **ENTER** and no changes are saved.

Appendix I: Troubleshooting/Error Codes

FAULT	CAUSE	SOLUTION
-UL-- LOADCELL FAILURE	Scale restricted. Debris under scale. Scale behind **0**. Load Cell failure.	Correct the bind or restriction. Remove debris under the scale/cells. Replace items removed from the scale. Call Fairbanks service.
--oL-- LOADCELL FAILURE	Overloaded Scale. Load Cell failure.	Remove weight from the scale. Call Fairbanks service.
• **RECHARGE**	Battery voltage low between **5.4** to **5.32VDC**.	Recharge the battery.
• **LoBAtt**	Battery voltage low, between **5.3** to **5.12VDC**	Recharge the battery *IMMEDIATELY.*
• **err 069**	Programming input error.	Recycle the power to instrument.
• **likely lc error**	**0shift** out of range Load Cell Failure.	Remove weight from the scale. Re-zero the scale. Call Fairbanks service.
• **Gt6Chr**	An entry of greater than 6 characters has been attempted.	Ensure a correct entry not exceeding 6 characters.

Appendix II: FM Control Drawings



NOTES:

1. Installation shall be in accordance with the National Electrical Code(ANSI/NFPA 70) and ANSI/ISA-RP12.6 "Installation of Intrinsically Safe Instrument Systems in Class I Hazardous (Classified) Locations."
2. Size of wires in cable between ACC-2825 and 2800 or between 2800 and ACC-2802 or between ACC-2802s shall not exceed wire size 16AWG.
3. Strain gage based transducers must be FM approved (for installations requiring FM approval) or CSA certified (for installations requiring CSA approval) for the hazardous locations where they are installed and have appropriate entity parameters.
4. ALL UNUSED GLAND SEALS ARE PLUGGED.
5. SEE SHEET 6 FOR 2800 GLAND SEAL LOCATIONS AND CABLE FUNCTIONS.

---------- REVISIONS ----------

REV	DESCRIPTION	DATE	APP
1		01-17-01	
2	Rev Sheets 4 and 8	06-14-01	
3	Rev Sheets 4 and 8	07-04-01	
4	Add Sheets 9 & 10 per ECO 13469	07-02-03	MJQ
5	REV SHEETS 4 & 8 PER ECO 13552	06-26-04	MJQ
6	ADDED SHEETS 11 & 12 PER ECO 14036	6-9-09	GAL
7	REV SHEETS 9 & 10 PER ECO 14187	2-2-11	GAL
8	REV PER ECO 000048	2-01-19	BEM

ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.02v
It(Io) = 190 ma
Po = 0.38 w

Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH

HAZARDOUS AREAS:

CL I II III Div 2 Gp A B C D E F G

GROUPS A, B, C, D, E, F & G

This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!

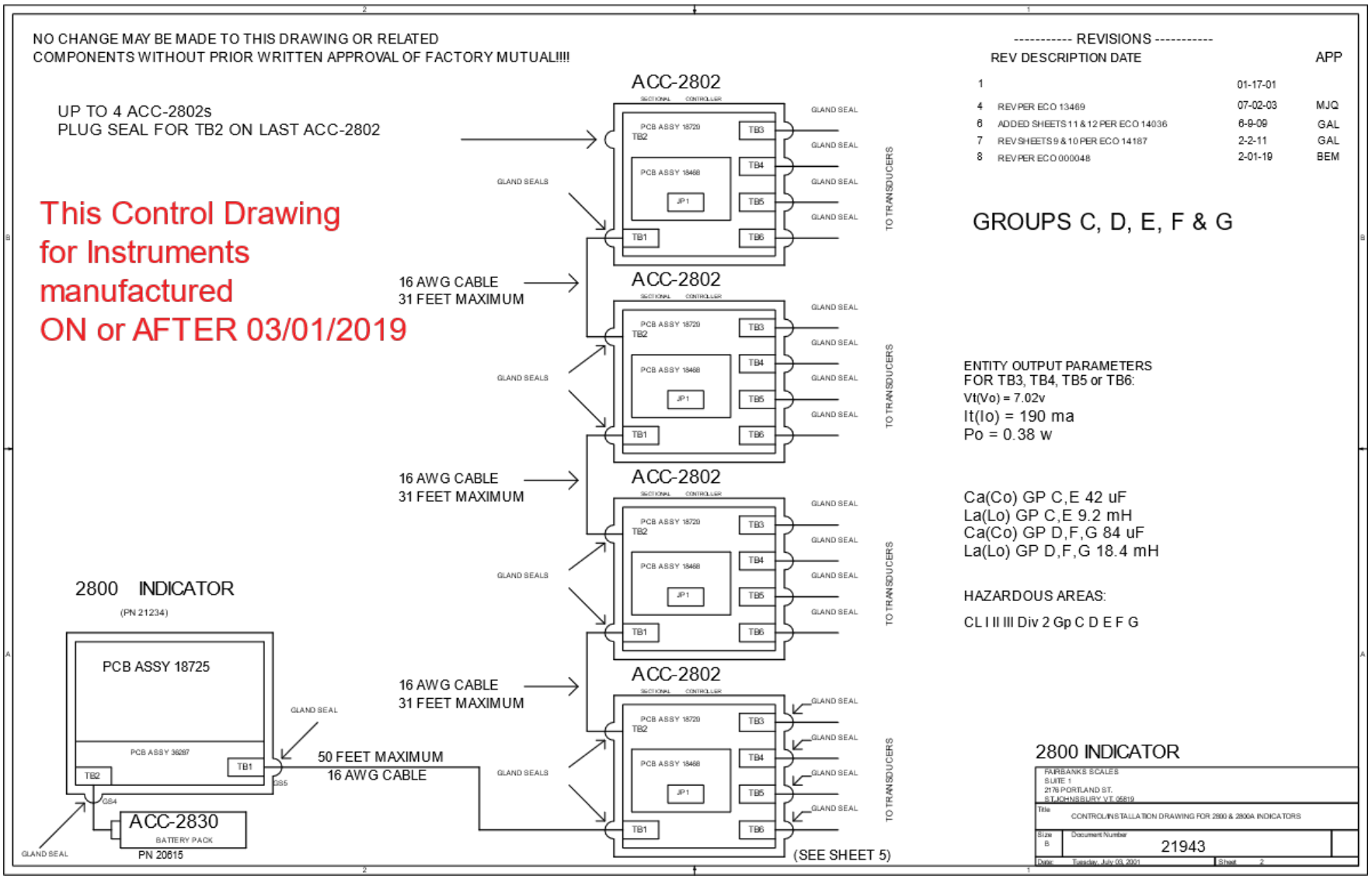
2800 INDICATOR

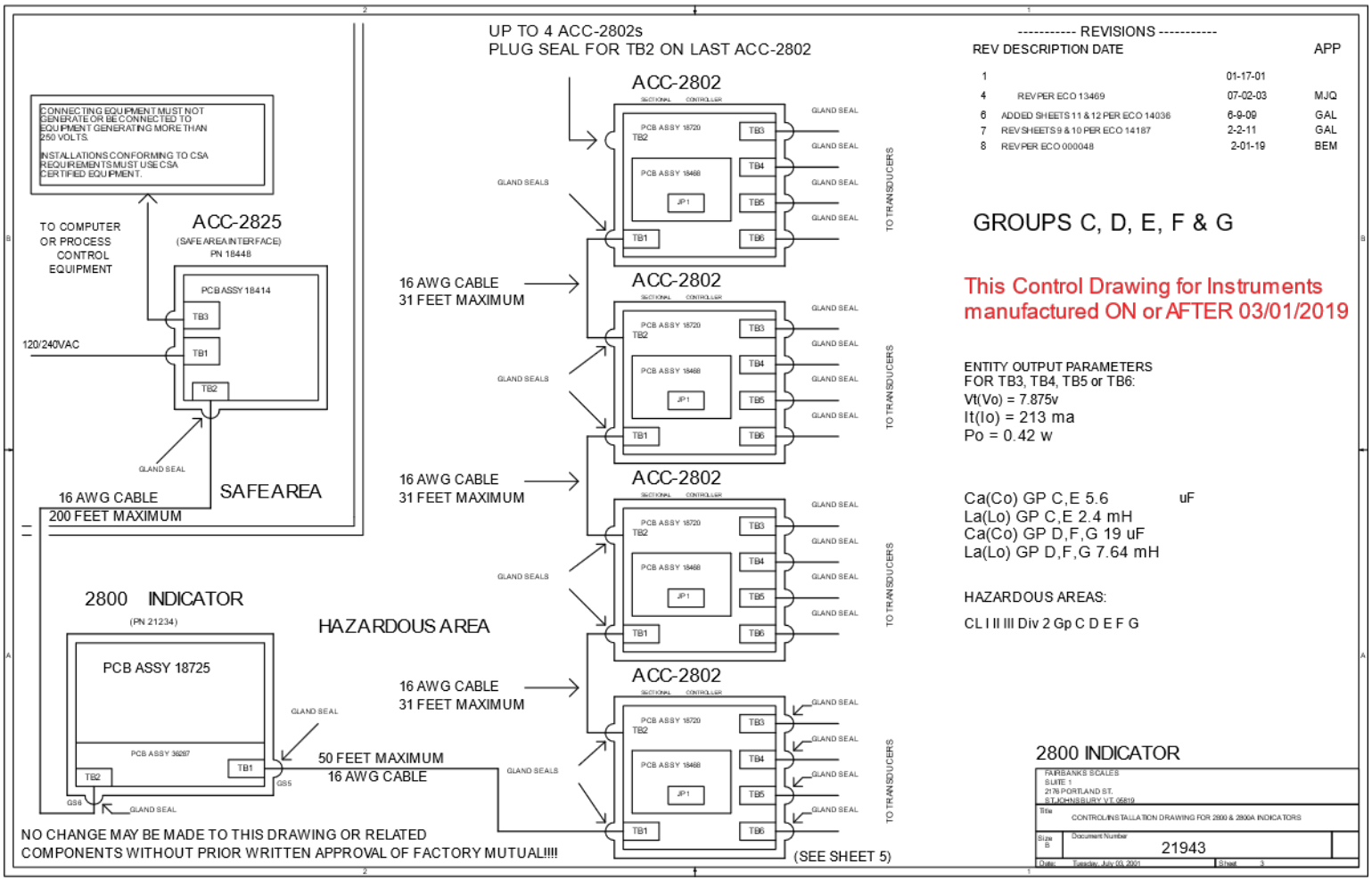
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST. JOHNSBURY, VT. 05819

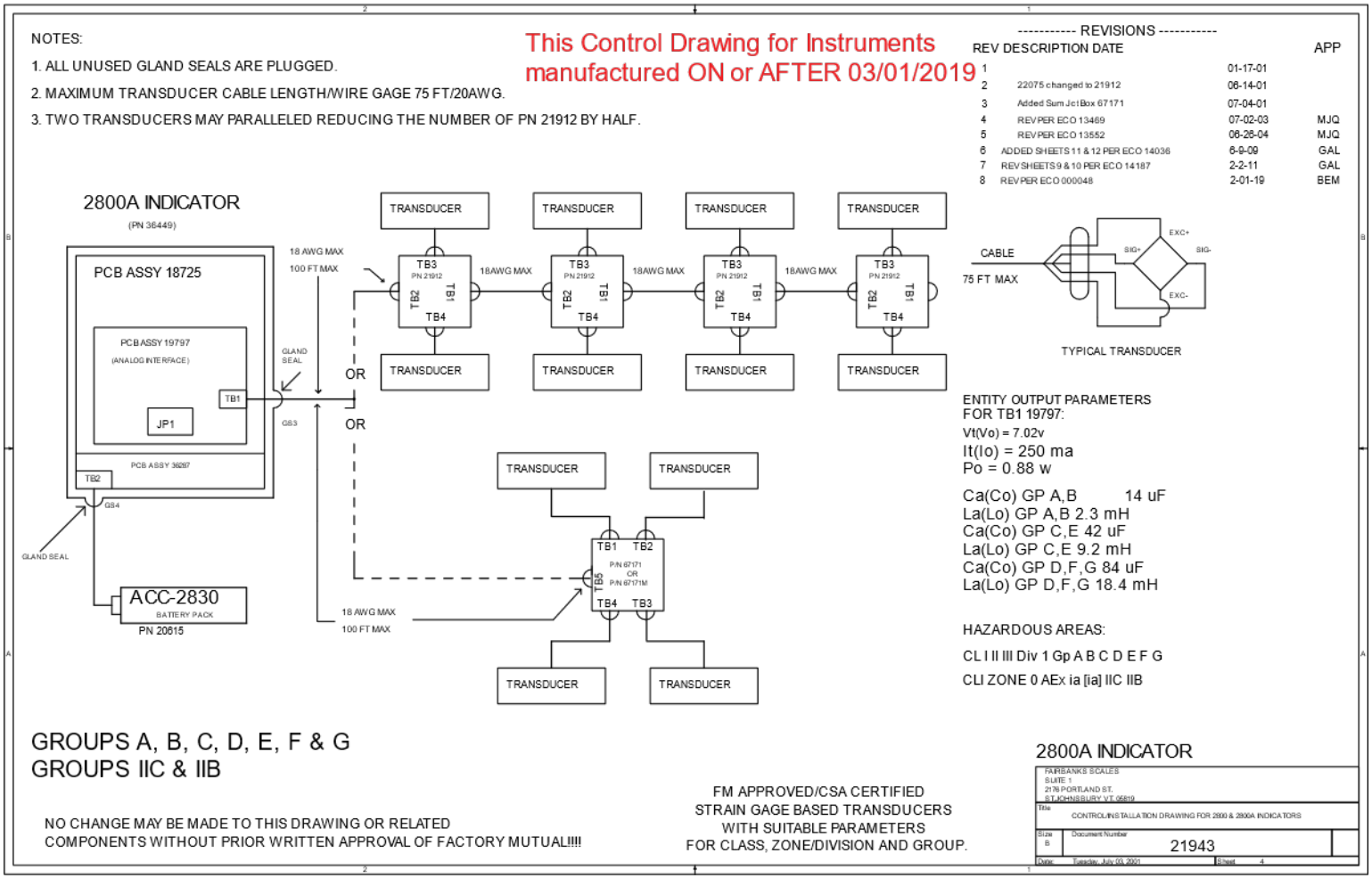
Title: CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS

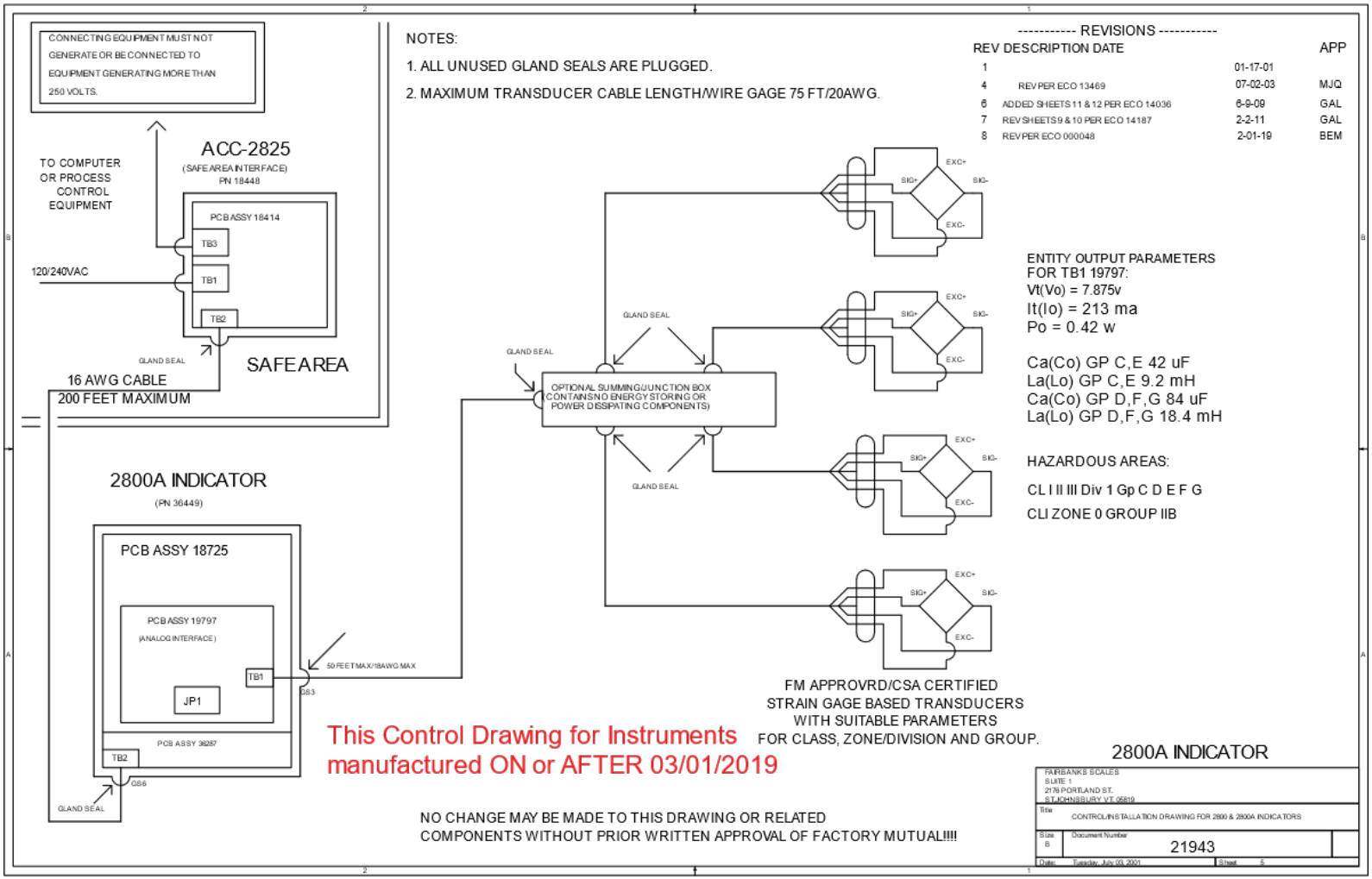
Size: B | Document Number: 21943

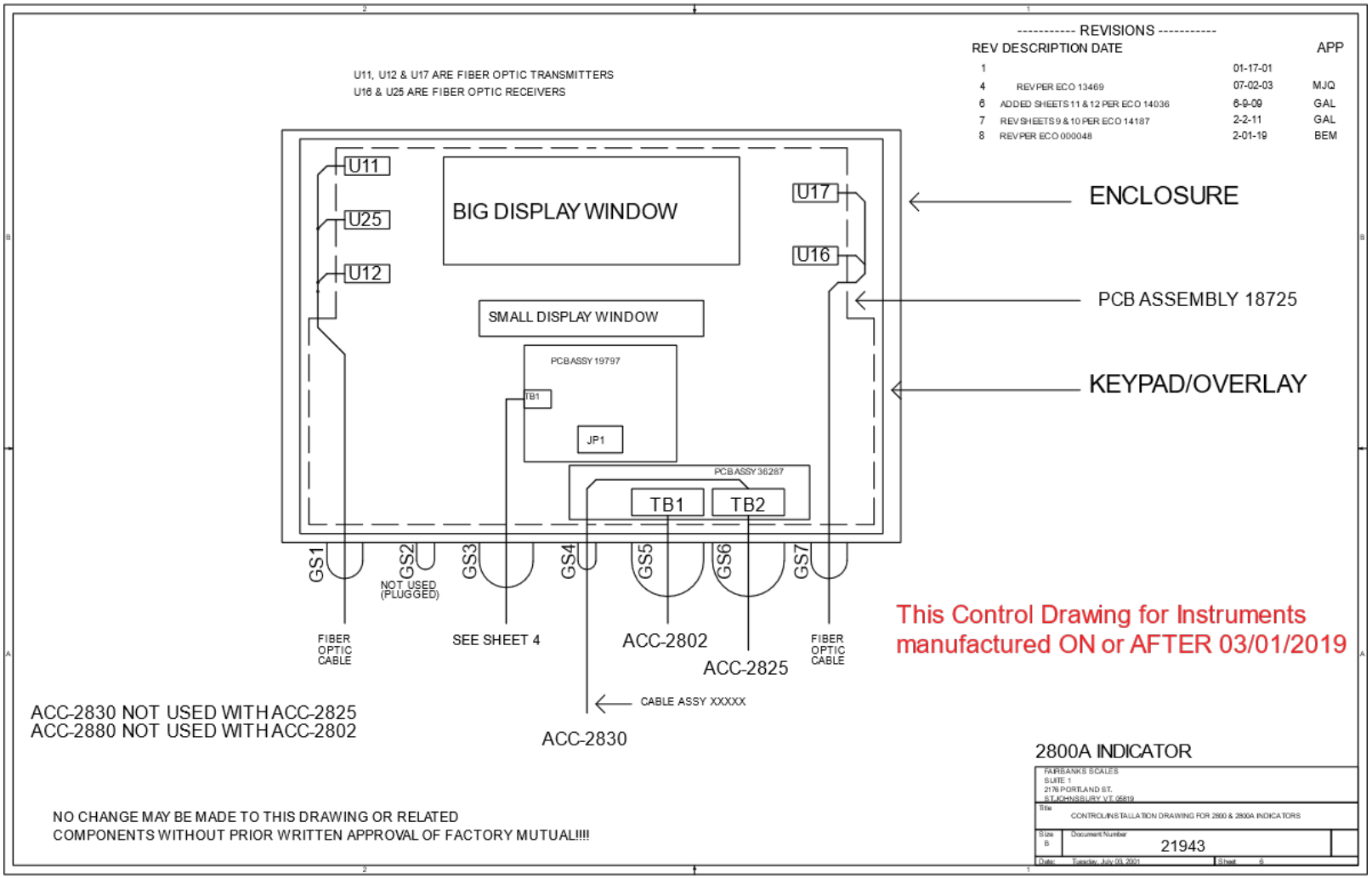
Date: Tuesday, July 09, 2002 | Sheet 1 of 12

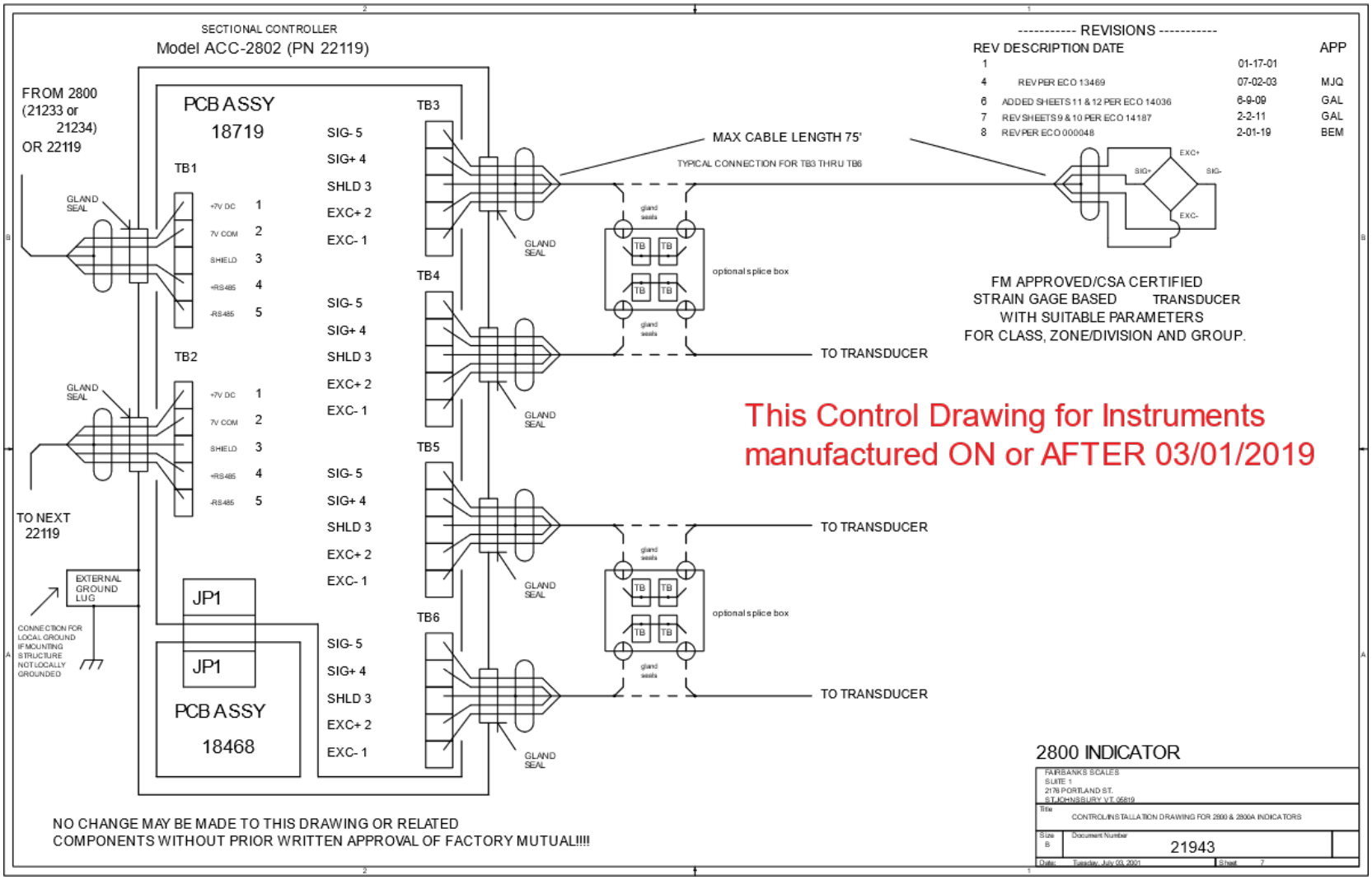

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
UP TO 4 ACC-2802s
PLUG SEAL FOR TB2 ON LAST ACC-2802
This Control Drawing
for Instruments
manufactured
ON or AFTER 03/01/2019
ACC-2802
16 AWG CABLE
31 FEET MAXIMUM
GLAND SEALS
TO TRANSDUCERS
2800 INDICATOR
(PN 21234)
PCB ASSY 18725
PCB ASSY 36297
50 FEET MAXIMUM
16 AWG CABLE
ACC-2830
BATTERY PACK
PN 20615
(SEE SHEET 5)
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
GROUPS C, D, E, F & G
ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.02v
It(Io) = 190 ma
Po = 0.38 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I II III Div 2 Gp C D E F G
2800 INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
21943

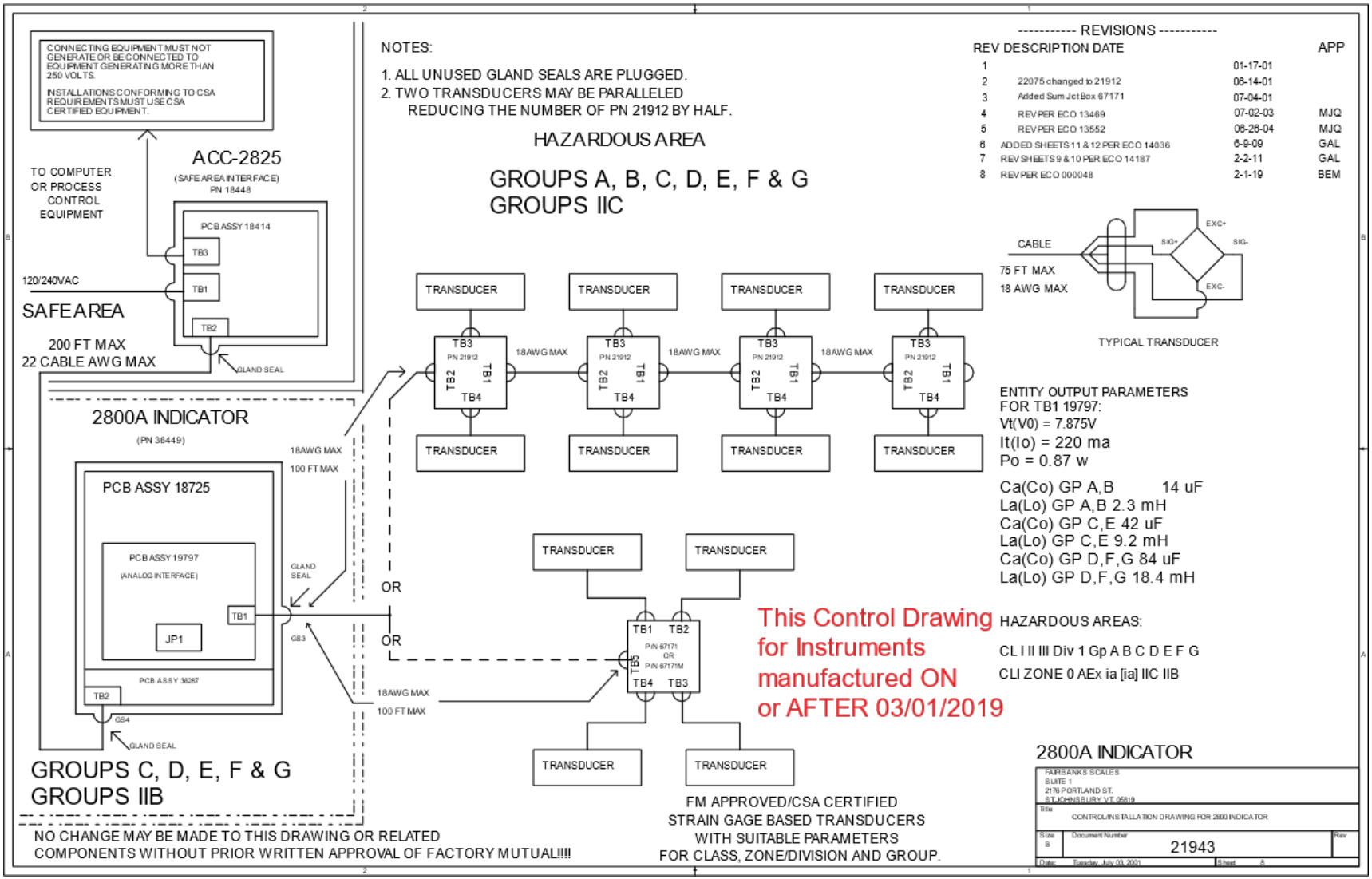

UP TO 4 ACC-2802s
PLUG SEAL FOR TB2 ON LAST ACC-2802
CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
INSTALLATIONS CONFORMING TO CSA REQUIREMENTS MUST USE CSA CERTIFIED EQUIPMENT.
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
GLAND SEAL
16 AWG CABLE
200 FEET MAXIMUM
SAFE AREA
2800 INDICATOR
(PN 21234)
PCB ASSY 18725
PCB ASSY 36297
TB1
TB2
GS5
GS6
GLAND SEAL
50 FEET MAXIMUM
16 AWG CABLE
HAZARDOUS AREA
16 AWG CABLE
31 FEET MAXIMUM
ACC-2802
SECTIONAL CONTROLLER
PCB ASSY 18720
PCB ASSY 18468
JP1
TB1
TB2
TB3
TB4
TB5
TB6
GLAND SEALS
GLAND SEAL
TO TRANSDUCERS
(SEE SHEET 5)
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
GROUPS C, D, E, F & G
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 5.6 uF
La(Lo) GP C,E 2.4 mH
Ca(Co) GP D,F,G 19 uF
La(Lo) GP D,F,G 7.64 mH
HAZARDOUS AREAS:
CL I II III Div 2 Gp C D E F G
2800 INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY, VT. 05819
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 3

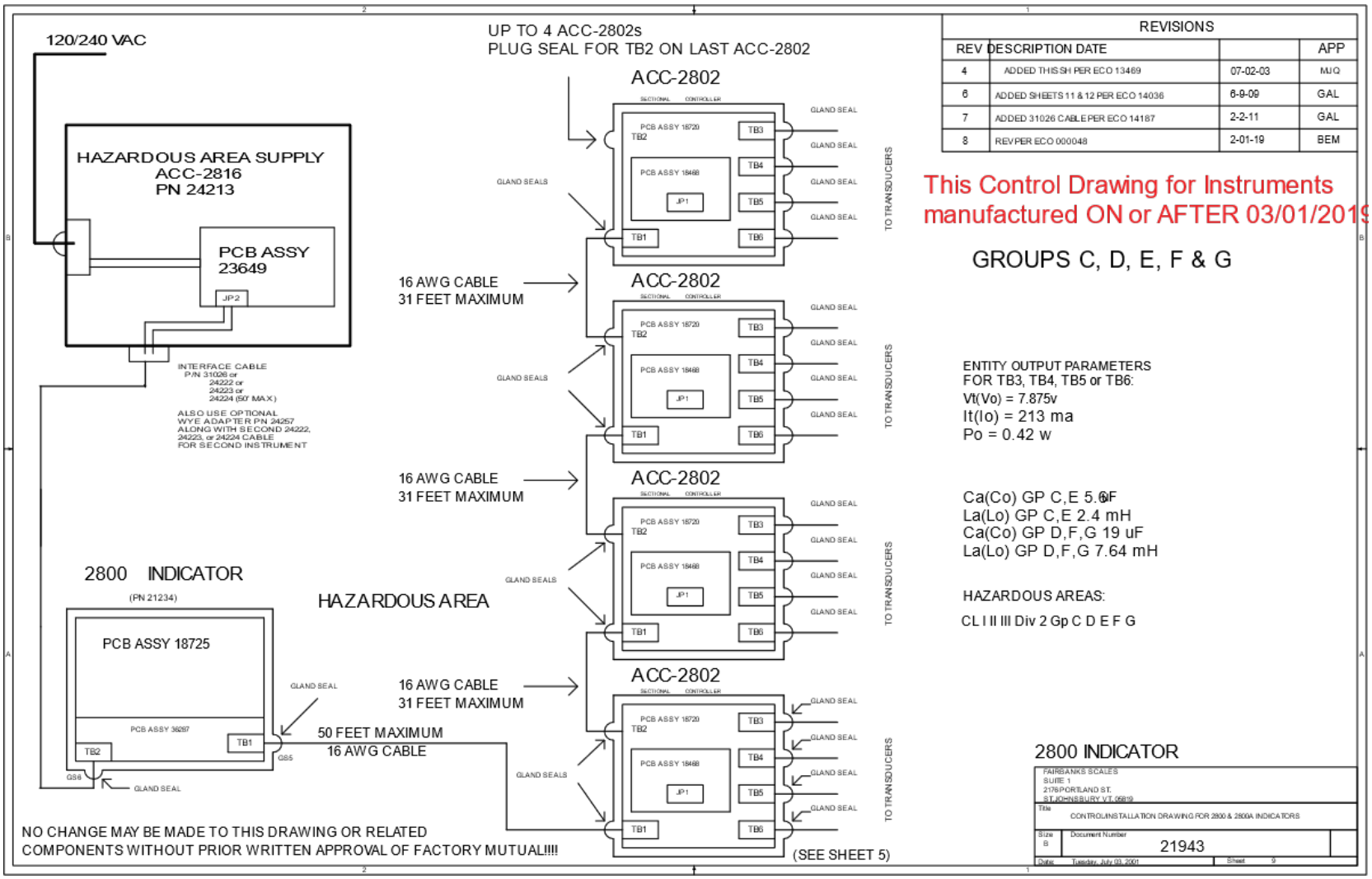

NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
3. TWO TRANSDUCERS MAY PARALLELED REDUCING THE NUMBER OF PN 21912 BY HALF.
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
2 22075 changed to 21912 06-14-01
3 Added Sum Jct Box 67171 07-04-01
4 REV PER ECO 13469 07-02-03 MJQ
5 REV PER ECO 13552 06-26-04 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
2800A INDICATOR
(PN 36449)
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
TB1
TB2
PCB ASSY 36297
GLAND SEAL
GS4
GS3
18 AWG MAX
100 FT MAX
OR
TRANSDUCER
TB3
P/N 21912
TB1
TB2
TB4
18AWG MAX
CABLE
75 FT MAX
EXC+
SIG+
SIG-
EXC-
TYPICAL TRANSDUCER
ENTITY OUTPUT PARAMETERS
FOR TB1 19797:
Vt(Vo) = 7.02v
It(Io) = 250 ma
Po = 0.88 w
Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I II III Div 1 Gp A B C D E F G
CLI ZONE 0 AEx ia [ia] IIC IIB
ACC-2830
BATTERY PACK
PN 20615
TB5
P/N 67171
OR
P/N 67171M
GROUPS A, B, C, D, E, F & G
GROUPS IIC & IIB
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
2800A INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 4


CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
GLAND SEAL
SAFE AREA
16 AWG CABLE
200 FEET MAXIMUM
2800A INDICATOR
(PN 36449)
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
TB1
JP1
PCB ASSY 36287
TB2
GS6
GS3
50 FEET MAX/18AWG MAX
GLAND SEAL
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
GLAND SEAL
GLAND SEAL
OPTIONAL SUMMING/JUNCTION BOX CONTAINS NO ENERGY STORING OR POWER DISSIPATING COMPONENTS)
GLAND SEAL
EXC+
SIG+
SIG-
EXC-
ENTITY OUTPUT PARAMETERS
FOR TB1 19797:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I II III Div 1 Gp C D E F G
CLI ZONE 0 GROUP IIB
FM APPROVRD/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
2800A INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY, VT. 05819
Title
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 5


---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
U11, U12 & U17 ARE FIBER OPTIC TRANSMITTERS
U16 & U25 ARE FIBER OPTIC RECEIVERS
U11
U25
U12
BIG DISPLAY WINDOW
U17
U16
SMALL DISPLAY WINDOW
PCB ASSY 19797
TB1
JP1
PCB ASSY 36287
TB1
TB2
ENCLOSURE
PCB ASSEMBLY 18725
KEYPAD/OVERLAY
GS1
GS2
NOT USED (PLUGGED)
GS3
GS4
GS5
GS6
GS7
FIBER OPTIC CABLE
SEE SHEET 4
ACC-2802
ACC-2825
FIBER OPTIC CABLE
CABLE ASSY XXXXX
ACC-2830
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
ACC-2830 NOT USED WITH ACC-2825
ACC-2880 NOT USED WITH ACC-2802
2800A INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST. JOHNSBURY VT. 05819
CONTROL INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 6
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!


SECTIONAL CONTROLLER
Model ACC-2802 (PN 22119)
FROM 2800
(21233 or
21234)
OR 22119
PCB ASSY
18719
TB1
TB2
TB3
TB4
TB5
TB6
GLAND SEAL
+7V DC
7V COM
SHIELD
+RS485
-RS485
SIG- 5
SIG+ 4
SHLD 3
EXC+ 2
EXC- 1
MAX CABLE LENGTH 75'
TYPICAL CONNECTION FOR TB3 THRU TB6
optional splice box
TO TRANSDUCER
TO NEXT
22119
EXTERNAL
GROUND
LUG
CONNECTION FOR
LOCAL GROUND
IF MOUNTING
STRUCTURE
NOT LOCALLY
GROUNDED
JP1
PCB ASSY
18468
REVISIONS
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
EXC+
SIG+
SIG-
EXC-
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCER
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
This Control Drawing for Instruments
manufactured ON or AFTER 03/01/2019
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
2800 INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 7


CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
INSTALLATIONS CONFORMING TO CSA REQUIREMENTS MUST USE CSA CERTIFIED EQUIPMENT.
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
SAFE AREA
200 FT MAX
22 CABLE AWG MAX
GLAND SEAL
2800A INDICATOR
(PN 36449)
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
PCB ASSY 36287
GS4
GS3
18AWG MAX
100 FT MAX
GROUPS C, D, E, F & G
GROUPS IIB
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. TWO TRANSDUCERS MAY BE PARALLELED
REDUCING THE NUMBER OF PN 21912 BY HALF.
HAZARDOUS AREA
GROUPS A, B, C, D, E, F & G
GROUPS IIC
TRANSDUCER
TB3
PN 21912
TB4
18AWG MAX
OR
TB5
P/N 67171
OR
P/N 67171M
TB4 TB3
CABLE
75 FT MAX
18 AWG MAX
EXC+
SIG+
SIG-
EXC-
TYPICAL TRANSDUCER
ENTITY OUTPUT PARAMETERS
FOR TB1 19797:
Vt(V0) = 7.875V
It(Io) = 220 ma
Po = 0.87 w
Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
HAZARDOUS AREAS:
CL I II III Div 1 Gp A B C D E F G
CLI ZONE 0 AEx ia [ia] IIC IIB
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
2 22075 changed to 21912 06-14-01
3 Added Sum Jct Box 67171 07-04-01
4 REV PER ECO 13469 07-02-03 MJQ
5 REV PER ECO 13552 06-26-04 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-1-19 BEM
2800A INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
Title
CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number
21943
Rev
Date: Tuesday, July 03, 2001
Sheet 8



REVISIONS			
REV	DESCRIPTION	DATE	APP
4	ADDED THIS SH PER ECO 13469	07-02-03	MJQ
6	ADDED SHEETS 11 & 12 PER ECO 14036	6-9-09	GAL
7	ADDED 31026 CABLE PER ECO 14187	2-2-11	GAL
8	REV PER ECO 000048	2-01-19	BEM

This Control Drawing for Instruments manufactured ON or AFTER 03/01/201

GROUPS C, D, E, F & G

ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w

Ca(Co) GP C,E 5.6uF
La(Lo) GP C,E 2.4 mH
Ca(Co) GP D,F,G 19 uF
La(Lo) GP D,F,G 7.64 mH

HAZARDOUS AREAS:

CL I II III Div 2 Gp C D E F G

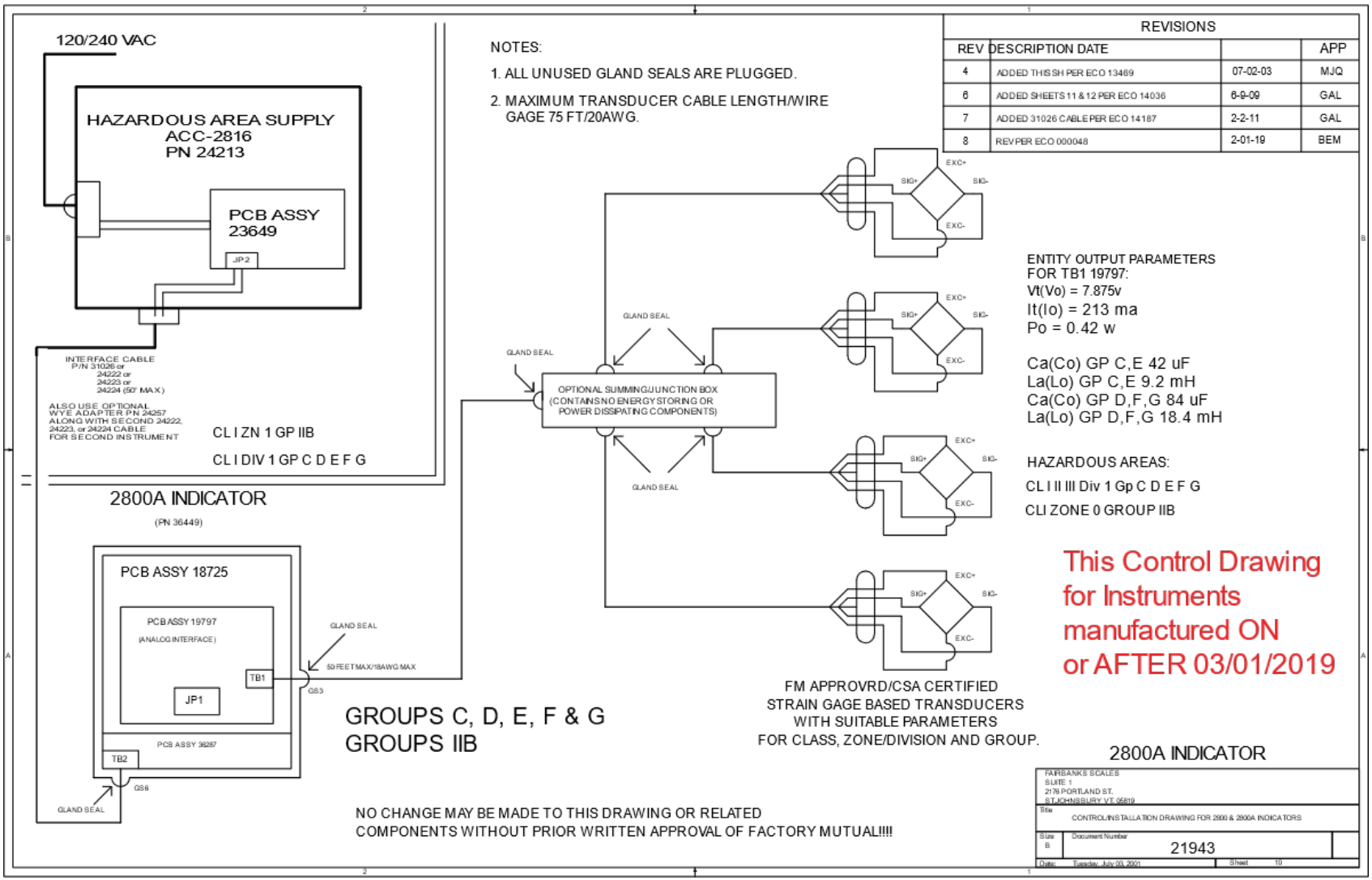
2800 INDICATOR

FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT. 05819

Title: CONTROL INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS

Size: B | Document Number: 21943

Date: Tuesday, July 03, 2001 | Sheet: 9


120/240 VAC
HAZARDOUS AREA SUPPLY
ACC-2816
PN 24213
PCB ASSY
23649
JP2
INTERFACE CABLE
P/N 31026 or
24222 or
24223 or
24224 (50' MAX.)
ALSO USE OPTIONAL
WYE ADAPTER PN 24257
ALONG WITH SECOND 24222,
24223, or 24224 CABLE
FOR SECOND INSTRUMENT
CL I ZN 1 GP IIB
CL I DIV 1 GP C D E F G
2800A INDICATOR
(PN 36449)
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
TB1
TB2
PCB ASSY 36287
GS3
GS6
GLAND SEAL
50 FEET MAX/18AWG MAX
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
OPTIONAL SUMMING/JUNCTION BOX
(CONTAINS NO ENERGY STORING OR
POWER DISSIPATING COMPONENTS)
EXC+
SIG+
SIG-
EXC-
REVISIONS
REV DESCRIPTION DATE APP
4 ADDED THIS SH PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 ADDED 31026 CABLE PER ECO 14187 2-2-11 GAL
8 REV PER ECO 000048 2-01-19 BEM
ENTITY OUTPUT PARAMETERS
FOR TB1 19797:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I II III Div 1 Gp C D E F G
CLI ZONE 0 GROUP IIB
This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019
GROUPS C, D, E, F & G
GROUPS IIB
FM APPROVRD/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
2800A INDICATOR
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819
CONTROL/INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS
Size B
Document Number
21943
Date: Tuesday, July 03, 2001
Sheet 10

NOTES:

1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.

---------- REVISIONS ----------

REV	DESCRIPTION	DATE	APP
6	ADDED THIS SHEET PER ECO 14036	6-9-09	GAL
7	REV SHEETS 9 & 10 PER ECO 14187	2-2-11	GAL
8	REV PER ECO 000048	2-01-19	BEM

2800A INDICATOR

(PN 36449)

PCB ASSY 18725

PCB ASSY 19797 (ANALOG INTERFACE)

JP1

TB1

GS3

GLAND SEAL

PCB ASSY 36287

TB2

GS4

GLAND SEAL

ACC-2830 BATTERY PACK PN 20615

18 AWG MAX 100 FT MAX

TRANSDUCER

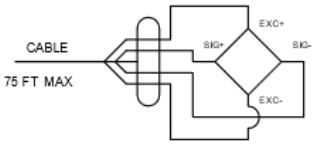
TRANSDUCER

TRANSDUCER

TRANSDUCER

4 TRANSDUCERS, TRANSDUCER CABLES MAY BE SOLDERED OR JOINED WITH WIRE NUTS. CABLE CONNECTIONS MAY OR MAY NOT BE INSIDE AN ENCLOSURE.

This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019



TYPICAL TRANSDUCER

ENTITY OUTPUT PARAMETERS FOR TB1 19797:

Vt(Vo) = 7.02v

It(Io) = 250 ma

Po = 0.88 w

Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH

HAZARDOUS AREAS:

CL I II III Div 1 Gp A B C D E F G

CLI ZONE 0 AEx ia [ia] IIC IIB

GROUPS A, B, C, D, E, F & G
GROUPS IIC & IIB

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!

FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.

2800A INDICATOR

FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819

Title: CONTROL INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS

Size: B | Document Number: 21943

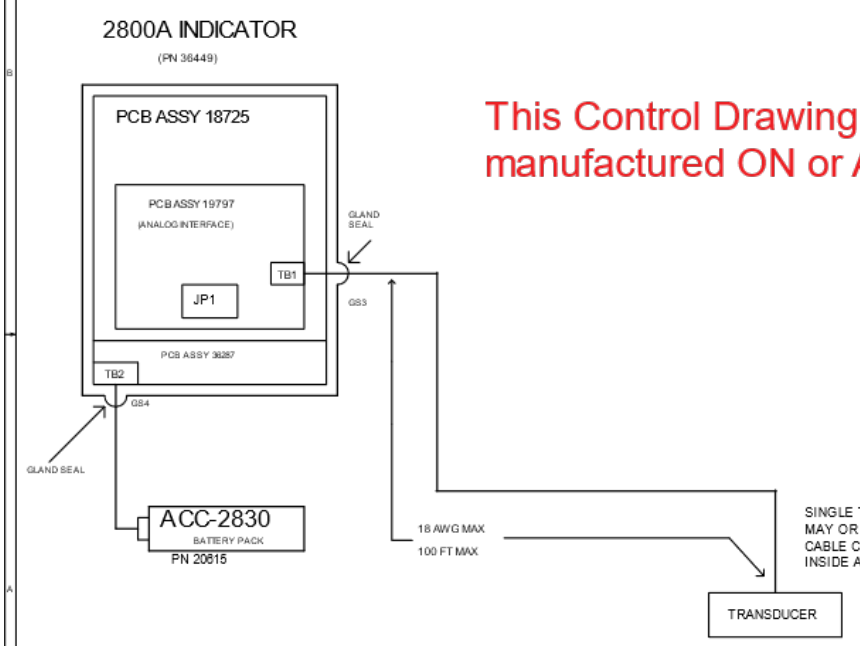
Date: Tuesday, July 03, 2001 | Sheet 11

NOTES:

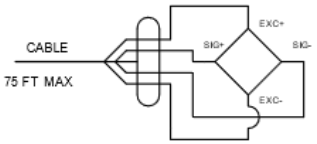
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.

---------- REVISIONS ----------

REV	DESCRIPTION	DATE	APP
6	ADDED THIS SHEET PER ECO 14036	6-9-09	GAL
7	REV SHEETS 9 & 10 PER ECO 14187	2-2-11	GAL
8	REV PER ECO 000048	2-01-19	BEM



This Control Drawing for Instruments manufactured ON or AFTER 03/01/2019



TYPICAL TRANSDUCER

SINGLE TRANSDUCER, TRANSDUCER CABLE MAY OR MAY NOT HAVE A CABLE SPLICE. CABLE CONNECTIONS MAY OR MAY NOT BE INSIDE AN ENCLOSURE.

ENTITY OUTPUT PARAMETERS FOR TB1 19797:

Vt(Vo) = 7.02v
It(Io) = 250 ma
Po = 0.88 w

Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH

HAZARDOUS AREAS:

CL I II III Div 1 Gp A B C D E F G

CLI ZONE 0 AEx ia [ia] IIC IIB

GROUPS A, B, C, D, E, F & G
GROUPS IIC & IIB

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!

FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.

2800A INDICATOR

FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY, VT. 05819

Title: CONTROL INSTALLATION DRAWING FOR 2800 & 2800A INDICATORS

Size: B | Document Number: 21943

Date: Tuesday, July 03, 2001 | Sheet: 12

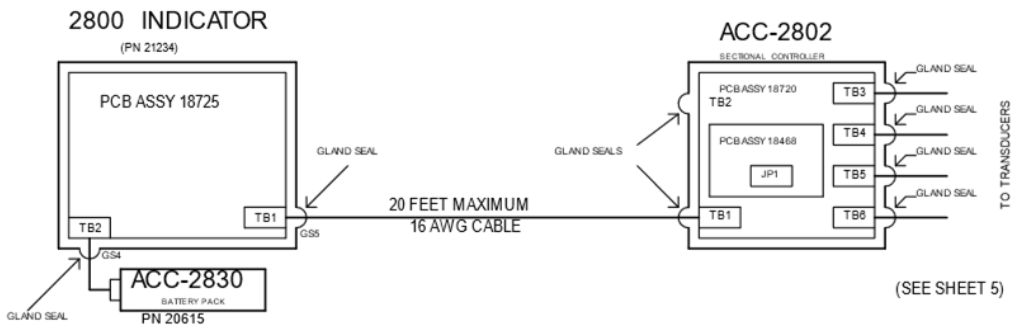
Appendix III: FM Control Drawings (Manufactured before 3-1-2019)

NOTES:

1. Installation shall be in accordance with the National Electrical Code(ANSI/NFPA 70) and ANSI/ISA-RP12.6 "Installation of Intrinsically Safe Instrument Systems in Class I Hazardous (Classified) Locations."
2. Size of wires in cable between ACC-2825 and 2800 or between 2800 and ACC-2802 or between ACC-2802s shall not exceed wire size 16AWG.
3. Strain gage based transducers must be FM approved (for installations requiring FM approval) or CSA certified (for installations requiring CSA approval) for the hazardous locations where they are installed and have appropriate entity parameters.
4. ALL UNUSED GLAND SEALS ARE PLUGGED.
5. SEE SHEET 6 FOR 2800 GLAND SEAL LOCATIONS AND CABLE FUNCTIONS.

---------- REVISIONS ----------

REV	DESCRIPTION	DATE	APP
1		01-17-01	
2	Rev Sheets 4 and 8	06-14-01	
3	Rev Sheets 4 and 8	07-04-01	
4	Add Sheets 9 & 10 per ECO 13469	07-02-03	MJQ
5	REV SHEETS 4 & 8 PER ECO 13552	06-26-04	MJQ
6	ADDED SHEETS 11 & 12 PER ECO 14036	6-9-09	GAL
7	REV SHEETS 9 & 10 PER ECO 14187	2-2-11	GAL



(SEE SHEET 5)

ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.02v
It(Io) = 190 ma
Po = 0.38 w

Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH

HAZARDOUS AREAS:

CL I, DIV 1 & 2, GP A, B, C & D
CL II, DIV 1 & 2, GP E, F & G
CL III

CL I Zones 0, 1, 2 GP IIC, IIB, IIA

GROUPS A, B, C, D, E, F & G
GROUPS IIC, IIB & IIA

This Control Drawing is for instruments manufactured BEFORE 03/01/2019

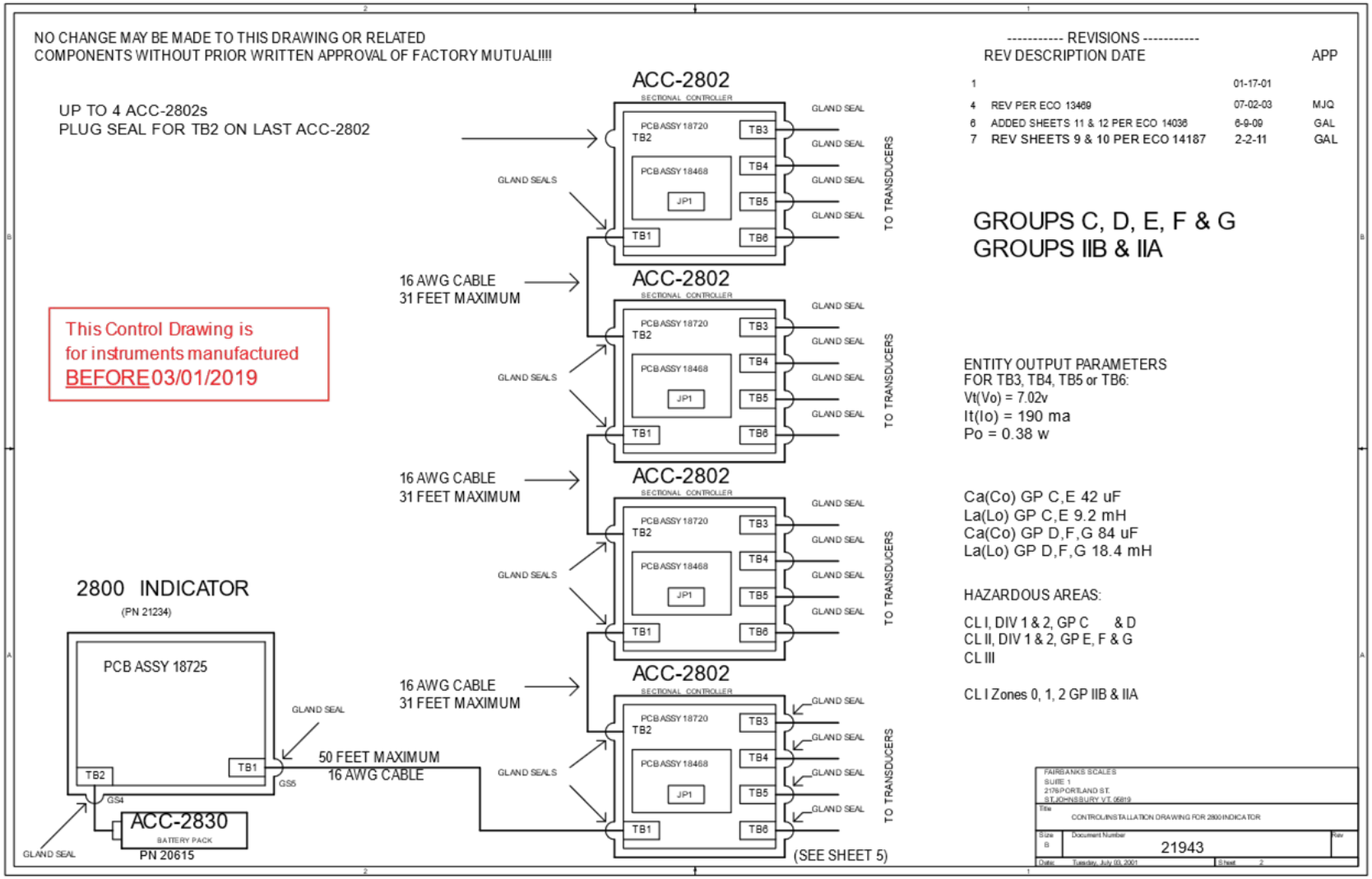
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!

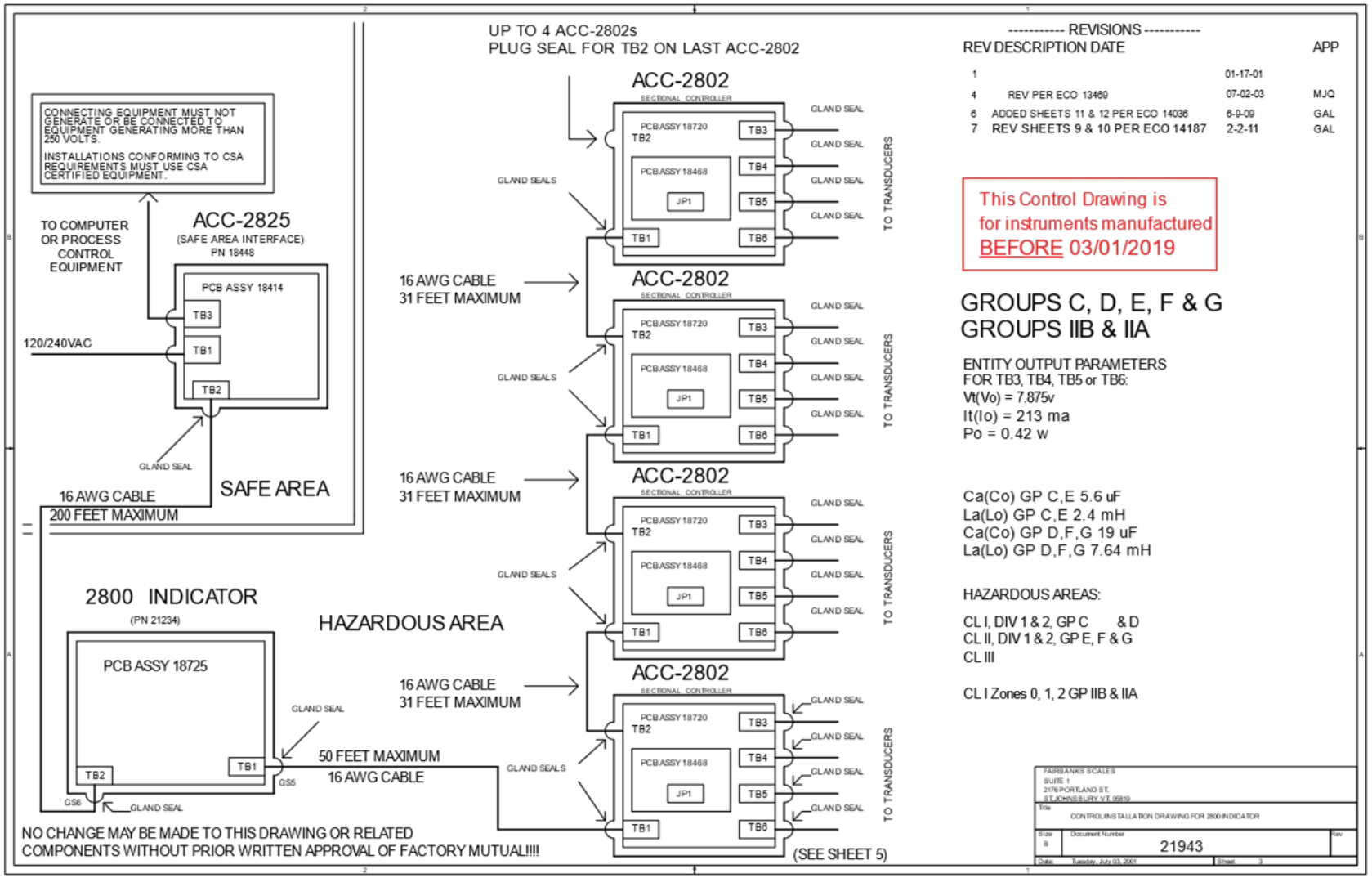
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819

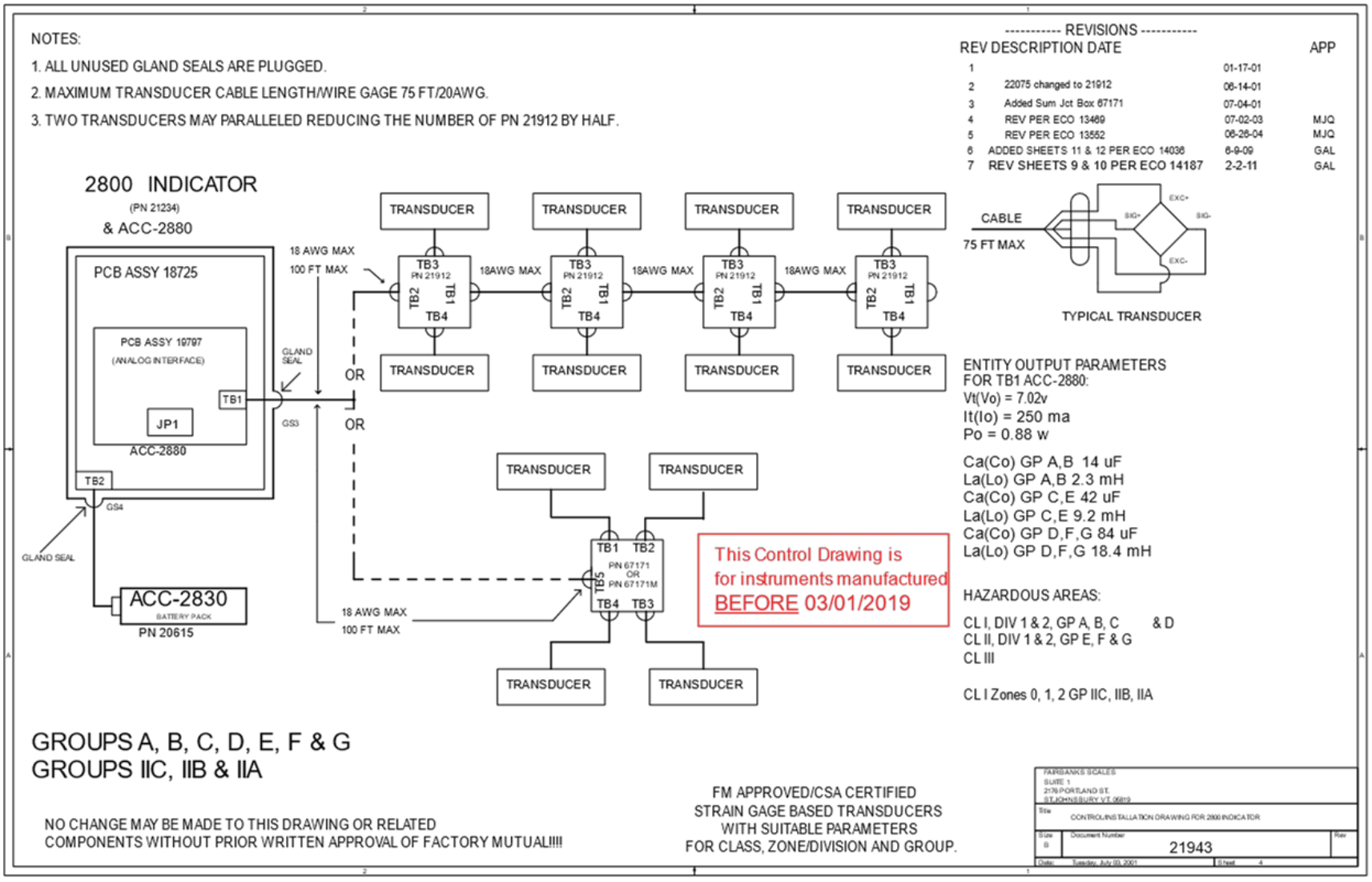
Title: CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR

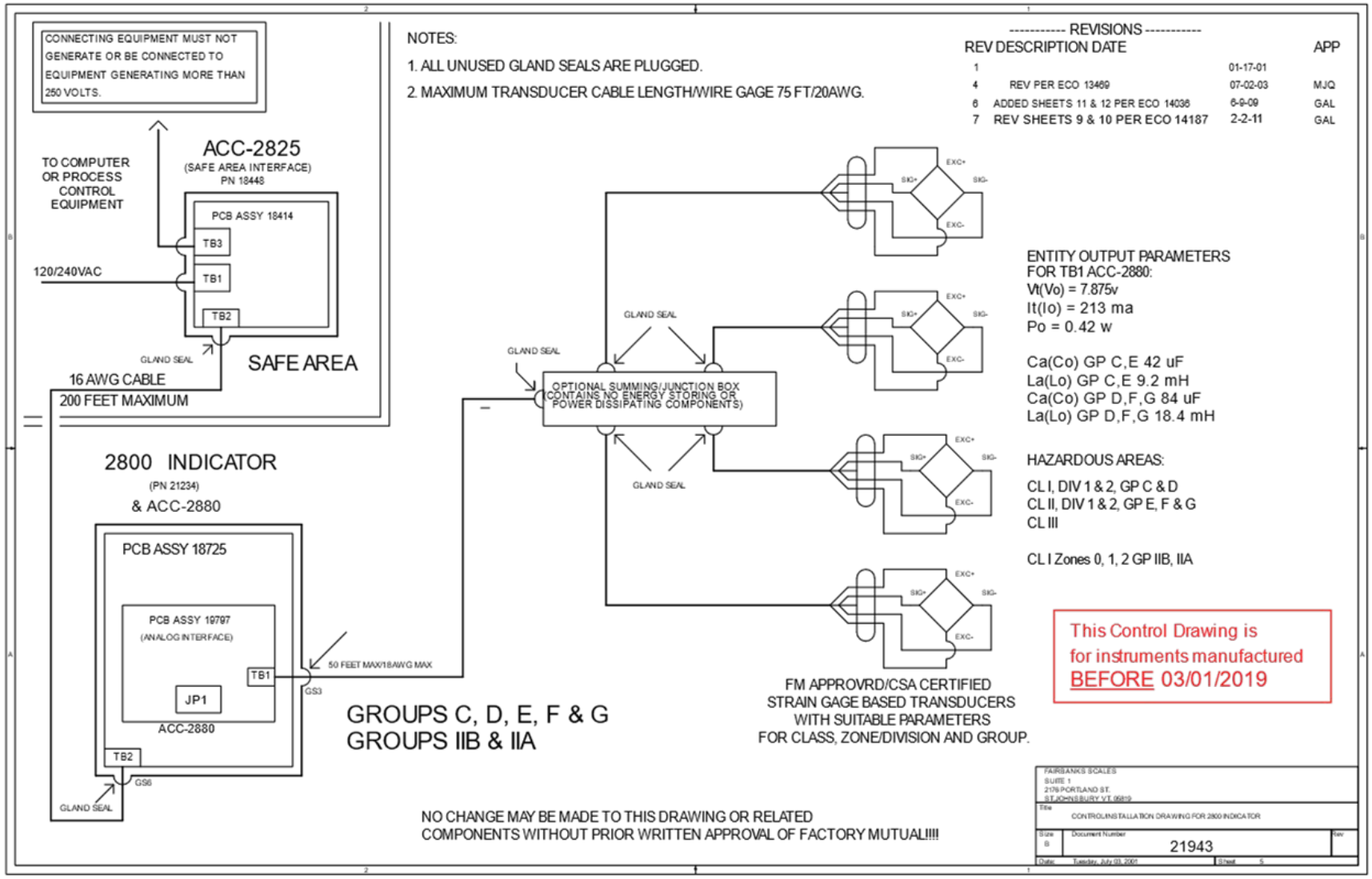
Size: B | Document Number: 21943

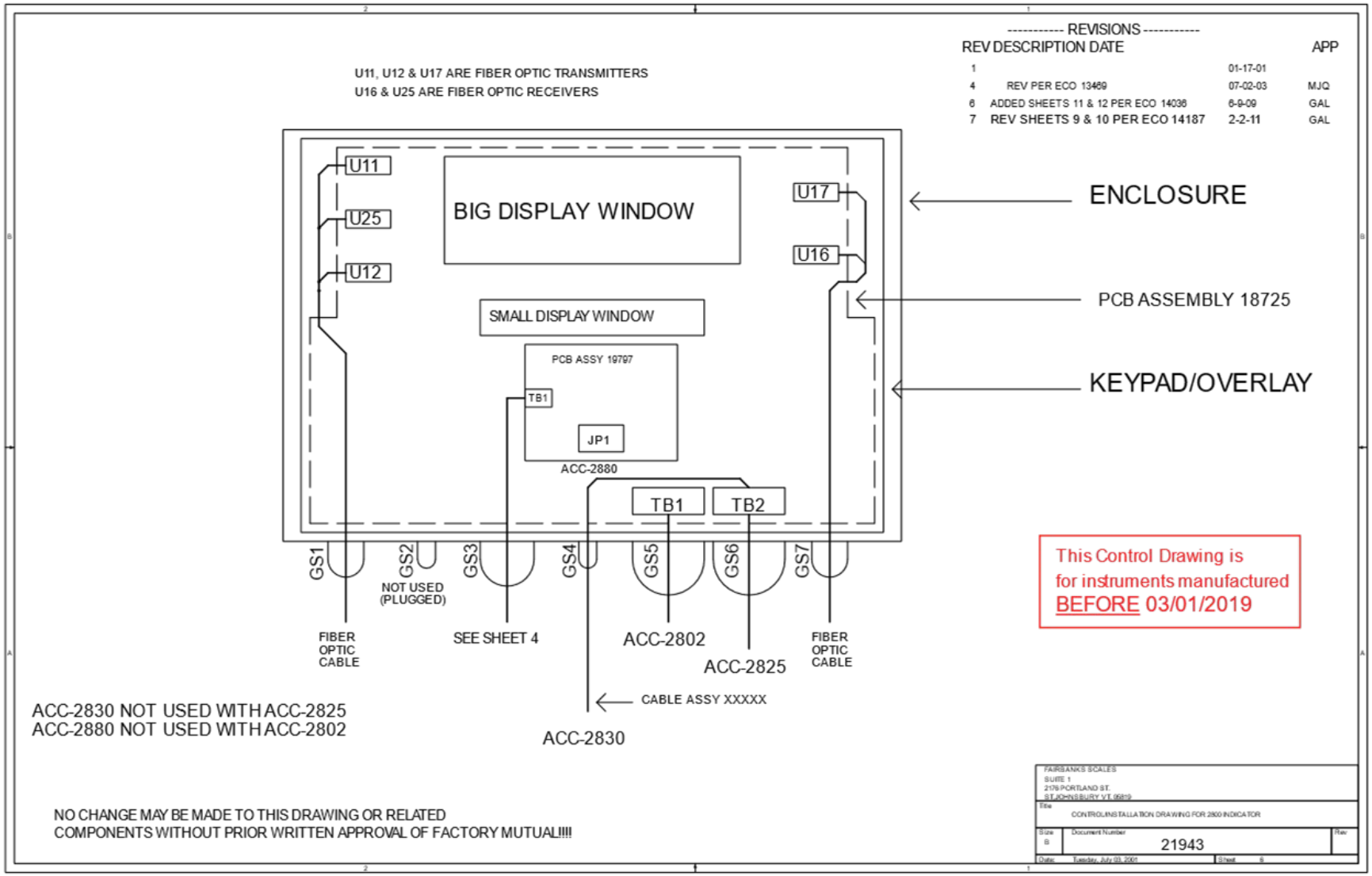
Date: Tuesday, July 03, 2001 | Sheet 1 of 12

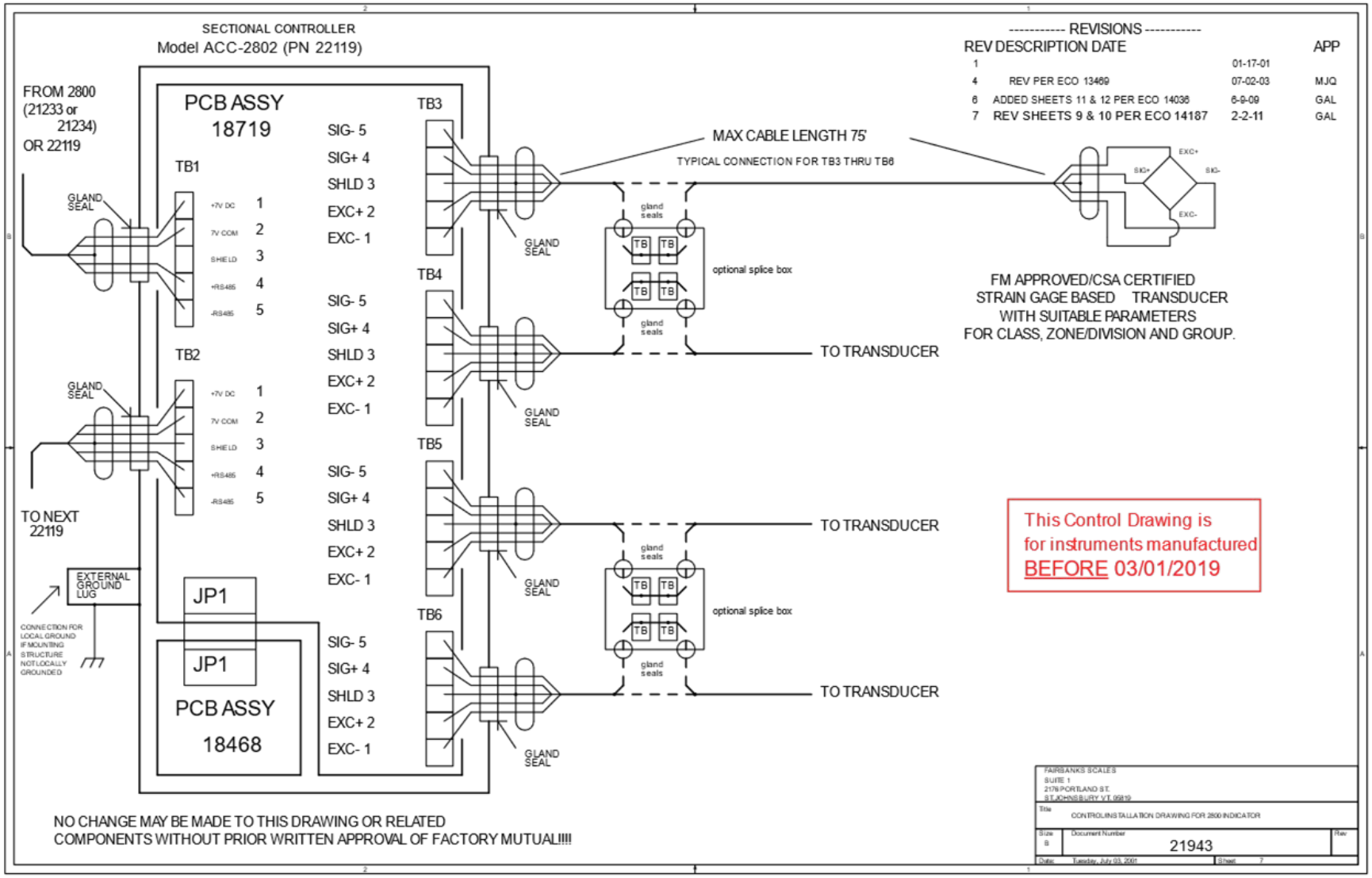

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
UP TO 4 ACC-2802s
PLUG SEAL FOR TB2 ON LAST ACC-2802
This Control Drawing is
for instruments manufactured
BEFORE 03/01/2019
ACC-2802
SECTIONAL CONTROLLER
PCB ASSY 18720
PCB ASSY 18468
TB1
TB2
TB3
TB4
TB5
TB6
JP1
GLAND SEAL
GLAND SEALS
TO TRANSDUCERS
16 AWG CABLE
31 FEET MAXIMUM
2800 INDICATOR
(PN 21234)
PCB ASSY 18725
50 FEET MAXIMUM
16 AWG CABLE
GS4
GS5
ACC-2830
BATTERY PACK
PN 20615
(SEE SHEET 5)
GROUPS C, D, E, F & G
GROUPS IIB & IIA
ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.02v
It(Io) = 190 ma
Po = 0.38 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIB & IIA
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT. 05819
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
21943

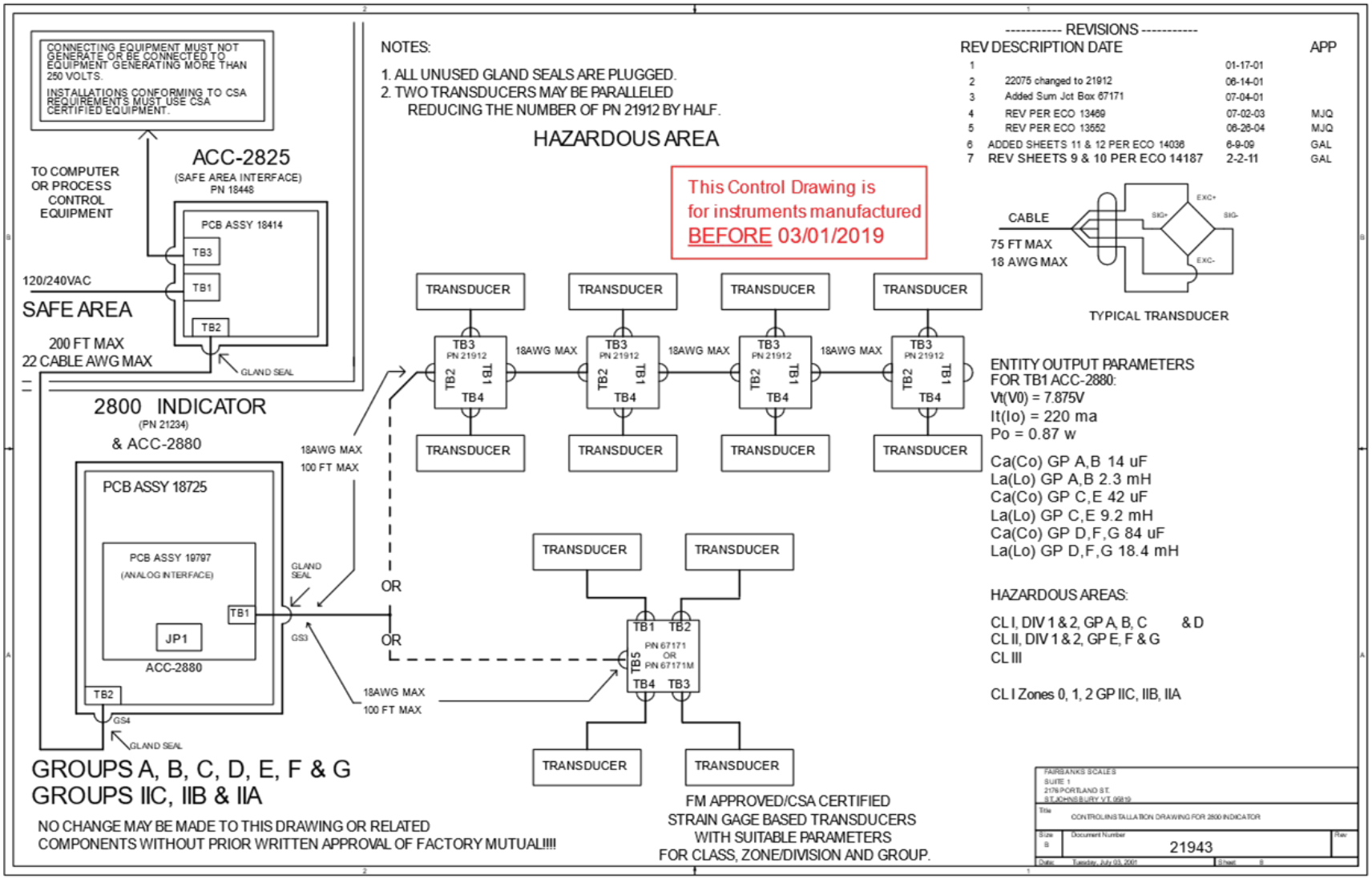

UP TO 4 ACC-2802s
PLUG SEAL FOR TB2 ON LAST ACC-2802
CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
INSTALLATIONS CONFORMING TO CSA REQUIREMENTS MUST USE CSA CERTIFIED EQUIPMENT.
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
GLAND SEAL
16 AWG CABLE
200 FEET MAXIMUM
SAFE AREA
2800 INDICATOR
(PN 21234)
PCB ASSY 18725
TB2
TB1
GS5
GS6
GLAND SEAL
50 FEET MAXIMUM
16 AWG CABLE
HAZARDOUS AREA
ACC-2802
SECTIONAL CONTROLLER
PCB ASSY 18720
TB2
PCB ASSY 18468
JP1
TB1
TB3
TB4
TB5
TB6
GLAND SEAL
GLAND SEALS
16 AWG CABLE
31 FEET MAXIMUM
TO TRANSDUCERS
(SEE SHEET 5)
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
This Control Drawing is for instruments manufactured BEFORE 03/01/2019
GROUPS C, D, E, F & G
GROUPS IIB & IIA
ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 5.6 uF
La(Lo) GP C,E 2.4 mH
Ca(Co) GP D,F,G 19 uF
La(Lo) GP D,F,G 7.64 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIB & IIA
FAIRBANKS SCALES
SUITE 1
2179 PORTLAND ST.
ST JOHNSBURY VT 05819
CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number 21943
Rev
Date: Tuesday, July 03, 2001
Sheet 3

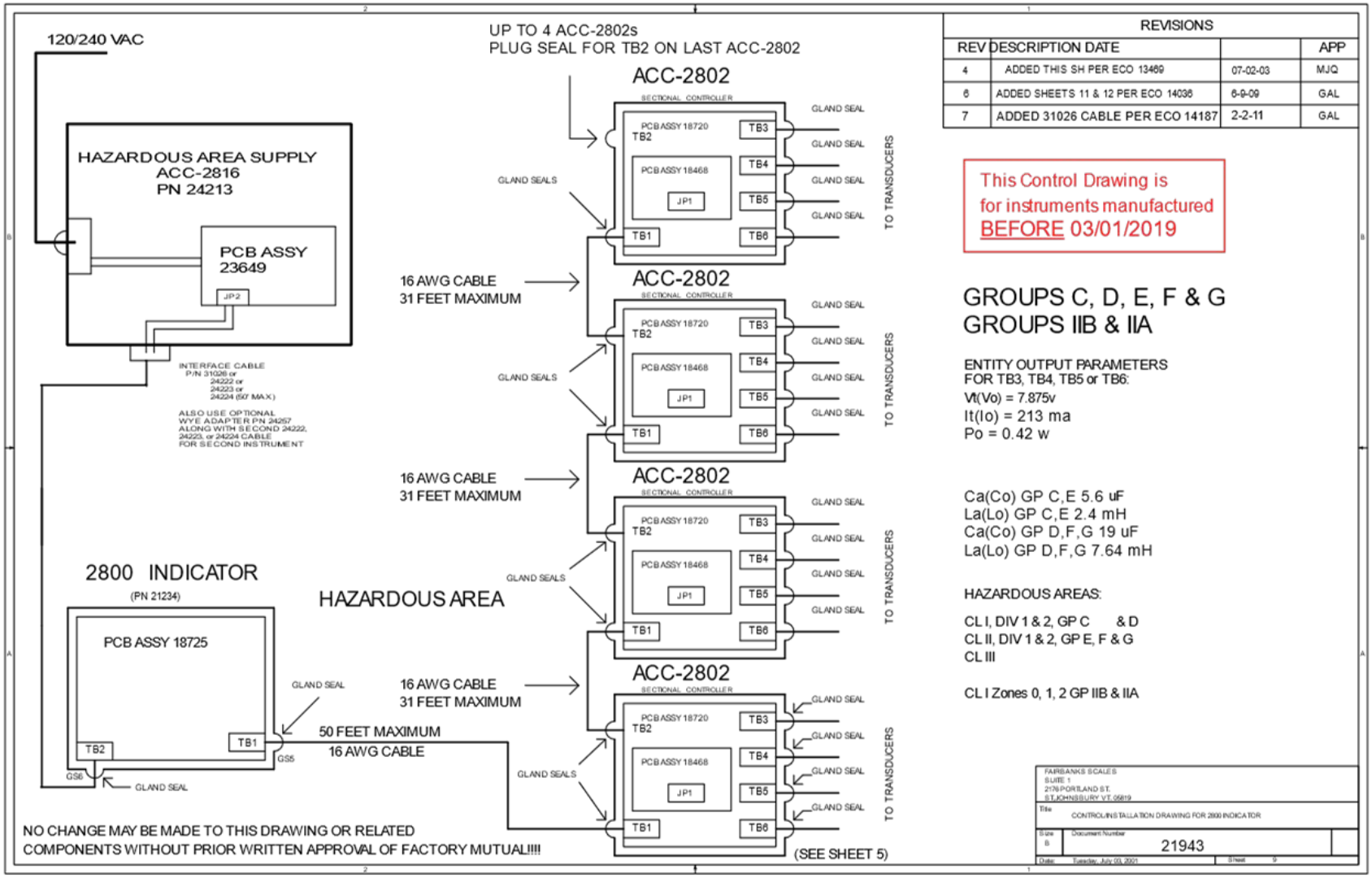

NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
3. TWO TRANSDUCERS MAY PARALLELED REDUCING THE NUMBER OF PN 21912 BY HALF.
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
2 22075 changed to 21912 06-14-01
3 Added Sum Jct Box 67171 07-04-01
4 REV PER ECO 13469 07-02-03 MJQ
5 REV PER ECO 13552 06-26-04 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
2800 INDICATOR
(PN 21234)
& ACC-2880
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
ACC-2880
TB1
TB2
GS3
GS4
GLAND SEAL
18 AWG MAX
100 FT MAX
OR
TRANSDUCER
TB3
PN 21912
TB2
TB1
TB4
18AWG MAX
ACC-2830
BATTERY PACK
PN 20615
TB5
PN 67171
OR
PN 67171M
TB1 TB2
TB4 TB3
CABLE
75 FT MAX
EXC+
SIG+
SIG-
EXC-
TYPICAL TRANSDUCER
ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(Vo) = 7.02v
It(Io) = 250 ma
Po = 0.88 w
Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP A, B, C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIC, IIB, IIA
This Control Drawing is
for instruments manufactured
BEFORE 03/01/2019
GROUPS A, B, C, D, E, F & G
GROUPS IIC, IIB & IIA
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number
21943
Rev
Date: Tuesday, July 03, 2001
Sheet 4

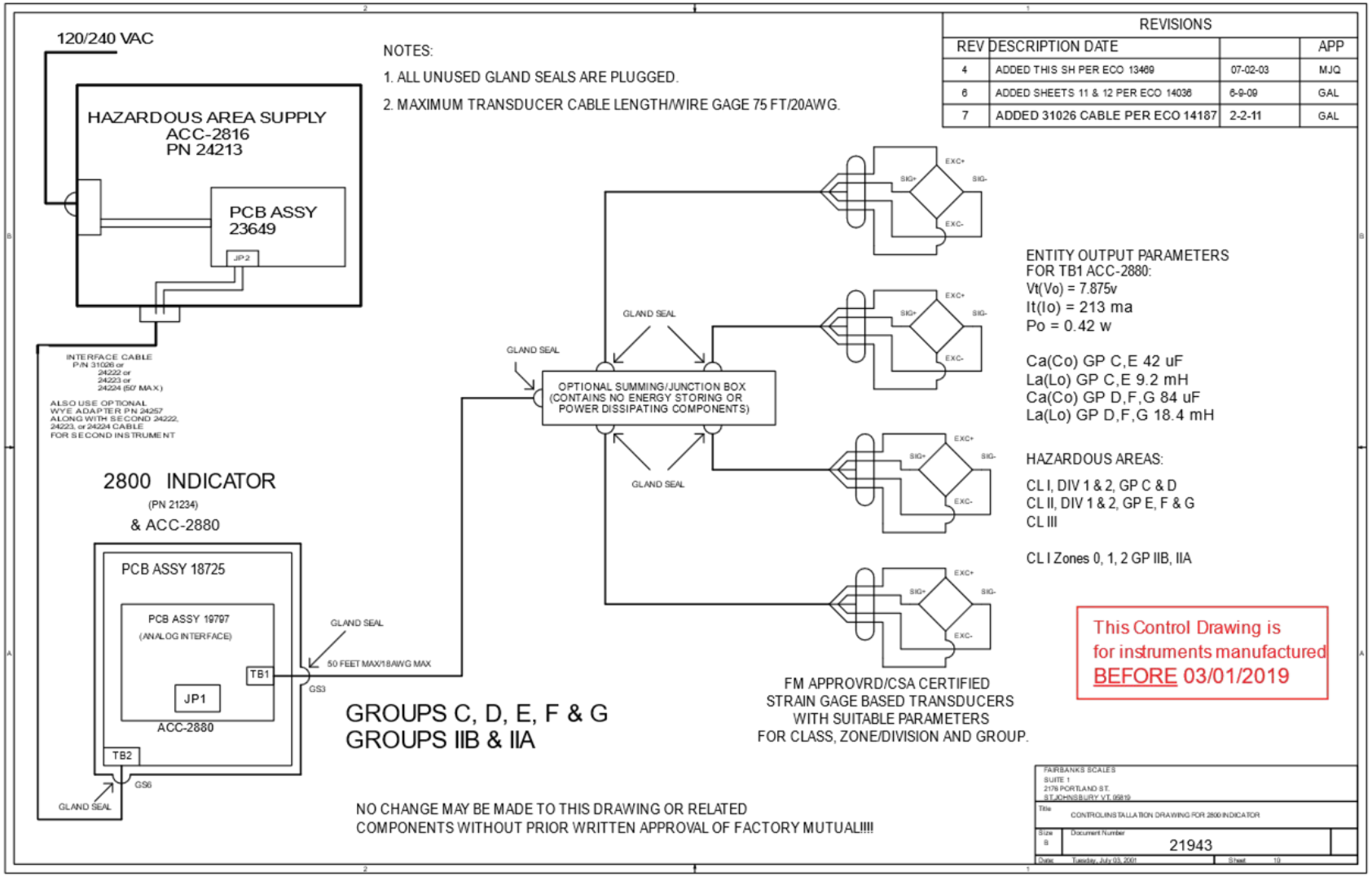

CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
GLAND SEAL
16 AWG CABLE
200 FEET MAXIMUM
SAFE AREA
2800 INDICATOR
(PN 21234)
& ACC-2880
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
ACC-2880
TB1
TB2
GS3
GS6
50 FEET MAX/18AWG MAX
GLAND SEAL
GLAND SEAL
GLAND SEAL
OPTIONAL SUMMING/JUNCTION BOX
(CONTAINS NO ENERGY STORING OR POWER DISSIPATING COMPONENTS)
GLAND SEAL
EXC+
SIG+
SIG-
EXC-
ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIB, IIA
This Control Drawing is for instruments manufactured BEFORE 03/01/2019
GROUPS C, D, E, F & G
GROUPS IIB & IIA
FM APPROVRD/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FAIRBANKS SCALES
SUITE 1
2175 PORTLAND ST.
ST JOHNSBURY VT 05819
Title
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number
21943
Rev
Date: Tuesday, July 03, 2001
Sheet 5


---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
U11, U12 & U17 ARE FIBER OPTIC TRANSMITTERS
U16 & U25 ARE FIBER OPTIC RECEIVERS
U11
U25
U12
BIG DISPLAY WINDOW
U17
U16
SMALL DISPLAY WINDOW
PCB ASSY 19797
TB1
JP1
ACC-2880
TB1
TB2
ENCLOSURE
PCB ASSEMBLY 18725
KEYPAD/OVERLAY
This Control Drawing is for instruments manufactured BEFORE 03/01/2019
GS1
GS2
GS3
GS4
GS5
GS6
GS7
NOT USED (PLUGGED)
FIBER OPTIC CABLE
SEE SHEET 4
ACC-2802
ACC-2825
FIBER OPTIC CABLE
CABLE ASSY XXXXX
ACC-2830
ACC-2830 NOT USED WITH ACC-2825
ACC-2880 NOT USED WITH ACC-2802
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number 21943
Rev
Date: Tuesday, July 03, 2001
Sheet 9


SECTIONAL CONTROLLER
Model ACC-2802 (PN 22119)
FROM 2800 (21233 or 21234) OR 22119
PCB ASSY 18719
TB1
TB2
TB3
TB4
TB5
TB6
SIG- 5
SIG+ 4
SHLD 3
EXC+ 2
EXC- 1
GLAND SEAL
MAX CABLE LENGTH 75'
TYPICAL CONNECTION FOR TB3 THRU TB6
optional splice box
TO TRANSDUCER
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCER
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
TO NEXT 22119
EXTERNAL GROUND LUG
JP1
PCB ASSY 18468
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
REVISIONS
REV DESCRIPTION DATE APP
1 01-17-01
4 REV PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
This Control Drawing is for instruments manufactured BEFORE 03/01/2019
FAIRBANKS SCALES
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
21943


CONNECTING EQUIPMENT MUST NOT GENERATE OR BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250 VOLTS.
INSTALLATIONS CONFORMING TO CSA REQUIREMENTS MUST USE CSA CERTIFIED EQUIPMENT.
TO COMPUTER OR PROCESS CONTROL EQUIPMENT
ACC-2825
(SAFE AREA INTERFACE)
PN 18448
PCB ASSY 18414
TB3
TB1
TB2
120/240VAC
SAFE AREA
200 FT MAX
22 CABLE AWG MAX
GLAND SEAL
2800 INDICATOR
(PN 21234)
& ACC-2880
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
ACC-2880
TB2
GS4
GLAND SEAL
18AWG MAX
100 FT MAX
GLAND SEAL
GS3
OR
OR
18AWG MAX
100 FT MAX
GROUPS A, B, C, D, E, F & G
GROUPS IIC, IIB & IIA
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. TWO TRANSDUCERS MAY BE PARALLELED
REDUCING THE NUMBER OF PN 21912 BY HALF.
HAZARDOUS AREA
This Control Drawing is
for instruments manufactured
BEFORE 03/01/2019
TRANSDUCER
TB3
PN 21912
TB2
TB1
TB4
18AWG MAX
TB1
TB2
TB5
PN 67171
OR
PN 67171M
TB4
TB3
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
1 01-17-01
2 22075 changed to 21912 06-14-01
3 Added Sum Jct Box 67171 07-04-01
4 REV PER ECO 13469 07-02-03 MJQ
5 REV PER ECO 13552 06-26-04 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 14187 2-2-11 GAL
CABLE
75 FT MAX
18 AWG MAX
EXC+
SIG+
SIG-
EXC-
TYPICAL TRANSDUCER
ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(V0) = 7.875V
It(Io) = 220 ma
Po = 0.87 w
Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP A, B, C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIC, IIB, IIA
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST JOHNSBURY VT 05819
Title
CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR
Size
B
Document Number
21943
Rev
Date: Tuesday, July 03, 2001
Sheet 8


120/240 VAC
HAZARDOUS AREA SUPPLY
ACC-2816
PN 24213
PCB ASSY
23649
JP2
INTERFACE CABLE
P/N 31026 or
24222 or
24223 or
24224 (50' MAX.)
ALSO USE OPTIONAL
WYE ADAPTER PN 24257
ALONG WITH SECOND 24222,
24223, or 24224 CABLE
FOR SECOND INSTRUMENT
2800 INDICATOR
(PN 21234)
PCB ASSY 18725
TB2
TB1
GS5
GS6
GLAND SEAL
16 AWG CABLE
31 FEET MAXIMUM
50 FEET MAXIMUM
16 AWG CABLE
HAZARDOUS AREA
UP TO 4 ACC-2802s
PLUG SEAL FOR TB2 ON LAST ACC-2802
ACC-2802
SECTIONAL CONTROLLER
PCB ASSY 18720
PCB ASSY 18468
JP1
TB1
TB2
TB3
TB4
TB5
TB6
GLAND SEALS
TO TRANSDUCERS
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
(SEE SHEET 5)
REVISIONS
REV DESCRIPTION DATE APP
4 ADDED THIS SH PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 ADDED 31026 CABLE PER ECO 14187 2-2-11 GAL
This Control Drawing is
for instruments manufactured
BEFORE 03/01/2019
GROUPS C, D, E, F & G
GROUPS IIB & IIA
ENTITY OUTPUT PARAMETERS
FOR TB3, TB4, TB5 or TB6:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 5.6 uF
La(Lo) GP C,E 2.4 mH
Ca(Co) GP D,F,G 19 uF
La(Lo) GP D,F,G 7.64 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIB & IIA
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT 05819
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
21943


120/240 VAC
HAZARDOUS AREA SUPPLY
ACC-2816
PN 24213
PCB ASSY
23649
JP2
INTERFACE CABLE
P/N 31026 or
24222 or
24223 or
24224 (50' MAX.)
ALSO USE OPTIONAL
WYE ADAPTER P/N 24257
ALONG WITH SECOND 24222,
24223, or 24224 CABLE
FOR SECOND INSTRUMENT
2800 INDICATOR
(PN 21234)
& ACC-2880
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
TB1
JP1
ACC-2880
TB2
GS6
GLAND SEAL
GLAND SEAL
50 FEET MAX/18AWG MAX
GS3
GLAND SEAL
GLAND SEAL
OPTIONAL SUMMING/JUNCTION BOX
(CONTAINS NO ENERGY STORING OR
POWER DISSIPATING COMPONENTS)
GLAND SEAL
EXC+
SIG+
SIG-
EXC-
NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
REVISIONS
REV DESCRIPTION DATE APP
4 ADDED THIS SH PER ECO 13469 07-02-03 MJQ
6 ADDED SHEETS 11 & 12 PER ECO 14036 6-9-09 GAL
7 ADDED 31026 CABLE PER ECO 14187 2-2-11 GAL
ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(Vo) = 7.875v
It(Io) = 213 ma
Po = 0.42 w
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIB, IIA
This Control Drawing is
for instruments manufactured
BEFORE 03/01/2019
GROUPS C, D, E, F & G
GROUPS IIB & IIA
FM APPROVRD/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED
COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819
CONTROL INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
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21943
Date: Tuesday, July 03, 2001
Sheet 10

NOTES:

1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.

This Control Drawing is for instruments manufactured BEFORE 03/01/2019

---------- REVISIONS ----------

REV	DESCRIPTION	DATE	APP
6	ADDED THIS SHEET PER ECO 14036	6-9-09	GAL
7	REV SHEETS 9 & 10 PER ECO 141872-2-11		GAL

2800 INDICATOR
(PN 21234)
& ACC-2880

PCB ASSY 18725

PCB ASSY 19797
(ANALOG INTERFACE)

JP1

ACC-2880

TB1

TB2

GS3

GS4

GLAND SEAL

GLAND SEAL

ACC-2830
BATTERY PACK
PN 20615

18 AWG MAX
100 FT MAX

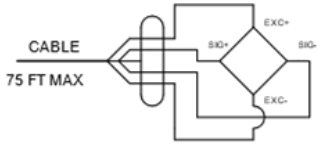
TRANSDUCER

TRANSDUCER

TRANSDUCER

TRANSDUCER

4 TRANSDUCERS, TRANSDUCER CABLES MAY BE SOLDERED OR JOINED WITH WIRE NUTS. CABLE CONNECTIONS MAY OR MAY NOT BE INSIDE AN ENCLOSURE.



TYPICAL TRANSDUCER

ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(Vo) = 7.02v
It(Io) = 250 ma
Po = 0.88 w

Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH

HAZARDOUS AREAS:

CL I, DIV 1 & 2, GP A, B, C & D
CL II, DIV 1 & 2, GP E, F & G
CL III

CL I Zones 0, 1, 2 GP IIC, IIB, IIA

GROUPS A, B, C, D, E, F & G
GROUPS IIC, IIB & IIA

NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!

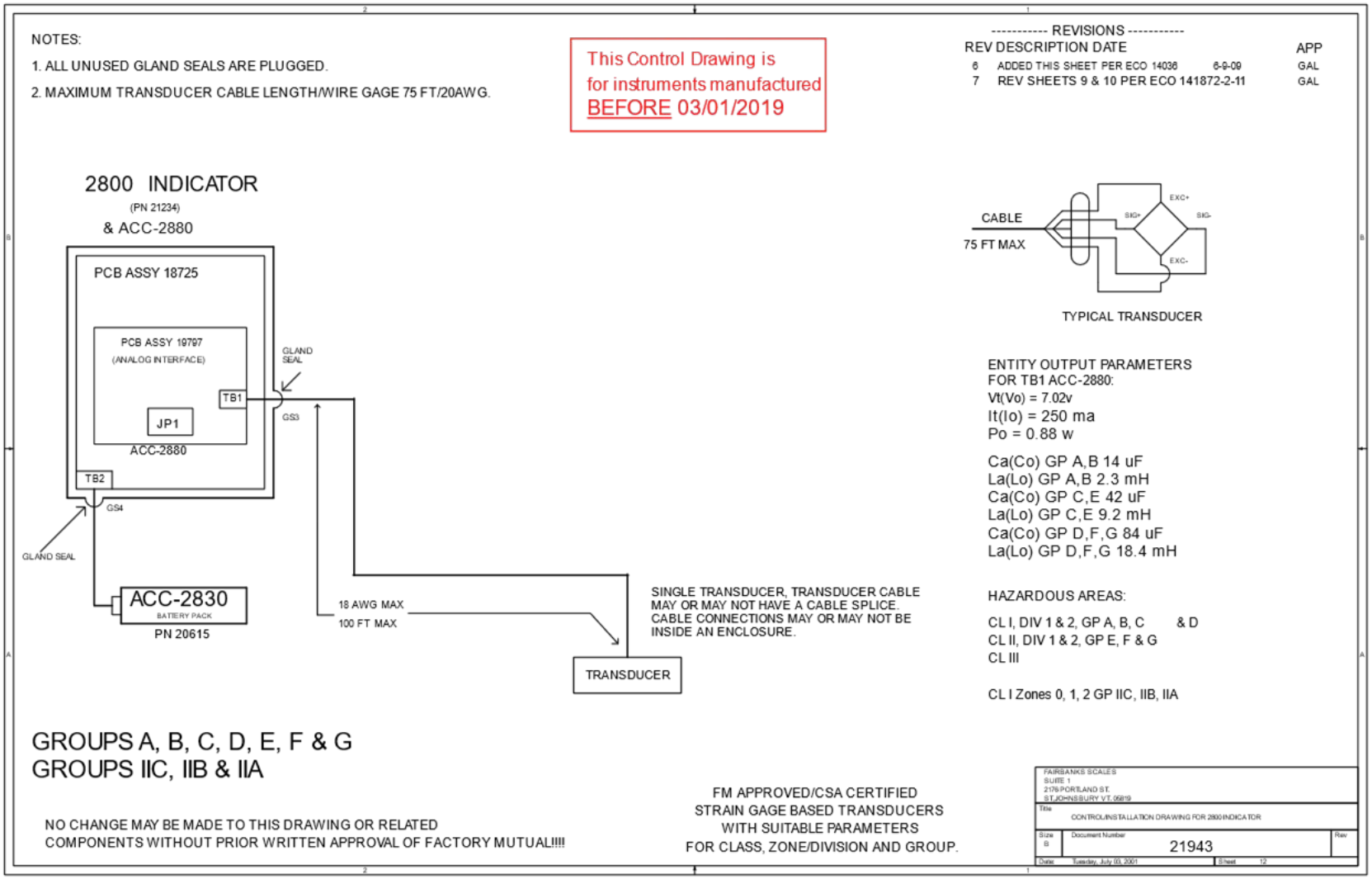
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.

FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819

Title: CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR

Size: B | Document Number: 21943 | Rev:

Date: Tuesday, July 03, 2001 | Sheet: 11


NOTES:
1. ALL UNUSED GLAND SEALS ARE PLUGGED.
2. MAXIMUM TRANSDUCER CABLE LENGTH/WIRE GAGE 75 FT/20AWG.
This Control Drawing is for instruments manufactured BEFORE 03/01/2019
---------- REVISIONS ----------
REV DESCRIPTION DATE APP
6 ADDED THIS SHEET PER ECO 14036 6-9-09 GAL
7 REV SHEETS 9 & 10 PER ECO 141872-2-11 GAL
2800 INDICATOR
(PN 21234)
& ACC-2880
PCB ASSY 18725
PCB ASSY 19797
(ANALOG INTERFACE)
JP1
TB1
TB2
ACC-2880
GLAND SEAL
GS3
GS4
GLAND SEAL
ACC-2830
BATTERY PACK
PN 20615
18 AWG MAX
100 FT MAX
TRANSDUCER
SINGLE TRANSDUCER, TRANSDUCER CABLE MAY OR MAY NOT HAVE A CABLE SPLICE. CABLE CONNECTIONS MAY OR MAY NOT BE INSIDE AN ENCLOSURE.
CABLE
75 FT MAX
EXC+
SIG+
SIG-
EXC-
TYPICAL TRANSDUCER
ENTITY OUTPUT PARAMETERS
FOR TB1 ACC-2880:
Vt(Vo) = 7.02v
It(Io) = 250 ma
Po = 0.88 w
Ca(Co) GP A,B 14 uF
La(Lo) GP A,B 2.3 mH
Ca(Co) GP C,E 42 uF
La(Lo) GP C,E 9.2 mH
Ca(Co) GP D,F,G 84 uF
La(Lo) GP D,F,G 18.4 mH
HAZARDOUS AREAS:
CL I, DIV 1 & 2, GP A, B, C & D
CL II, DIV 1 & 2, GP E, F & G
CL III
CL I Zones 0, 1, 2 GP IIC, IIB, IIA
GROUPS A, B, C, D, E, F & G
GROUPS IIC, IIB & IIA
NO CHANGE MAY BE MADE TO THIS DRAWING OR RELATED COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL OF FACTORY MUTUAL!!!!
FM APPROVED/CSA CERTIFIED
STRAIN GAGE BASED TRANSDUCERS
WITH SUITABLE PARAMETERS
FOR CLASS, ZONE/DIVISION AND GROUP.
FAIRBANKS SCALES
SUITE 1
2176 PORTLAND ST.
ST.JOHNSBURY VT. 05819
CONTROL/INSTALLATION DRAWING FOR 2800 INDICATOR
Size B
Document Number
21943
Rev
Date Tuesday, July 03, 2001
Sheet 12

Appendix IV: Material Safety Data Sheet

EaglePicher™ Technologies

Material Safety Data Sheet (MSDS)

April, 2013

SECTION 1 --- PRODUCT AND MANUFACTURER/DISTRIBUTOR

Product Name: Valve Regulated Lead Acid (VRLA) Batteries

Manufacturer/Distributor: EaglePicher Technologies LLC

Commercial Power Solutions

3220 Industrial Road

Joplin MO 64801

Emergency Phone: Chemtrec: 800-424-9300

International: 703.527.3887

Email: solutions@eaglepicher.com

Website: www.epcompower.com

SECTION 2 --- HAZARDOUS COMPONENTS

Components	%Wt.	TLV	LD50 Oral	LC50 Inhalation	LC50 Contact
Lead (Pb, PbO2, $PbSO_4$)	About 70%	0.050mg/m^3.	< (500) mg/Kg	N/A	N/A
Sulfuric Acid	About 20%	1 mg/m^3.	(2.14) mg/Kg	N/A	N/A
Fiberglass Separator	About 5%	N/A	N/A	N/A	N/A
Container (ABS or PP)	About 5%	N/A	N/A	N/A	N/A

SECTION 3 --- PHYSICAL DATA

Components	Density	Melting Point	Solubility (in H2O)	Odor	Appearance
Lead	11.34	327.4°C	None	None	Silver-Gray Metal
Lead Sulfate	6.2	1170°C	40 mg/l (15°C)	None	White Powder
Lead Dioxide	9.4	290°C	None	None	Brown Powder
Sulfuric Acid	About 1.3(25°C)	About 114°C (Boiling)	100%	Acidic	Clear Colorless Liquid
Fiberglass Separator	N/A	N/A	Slight	Toxic	White Fibrous Glass Membrane
Container (ABS or PP)	N/A	N/A	None	No Odor	Solid Plastics

SECTION 4 --- PROTECTION

Exposure	Protection	Comments
Skin	Rubber gloves, Apron, Safety shoes	Protective equipment must be worn if battery is cracked or otherwise damaged.
Respiratory	Respirator (for lead)	A respirator should be worn during reclaim operations if the TLV is exceeded.
Eyes	Safety goggles, Face shield	In the UK use of this material must be assessed under the COSHH regulations.

SECTION 5 --- FIRST AID MEASURES

Emergency and First Aid Procedures	Contact with internal components if battery is opened/broken.
1. Inhalation	Remove to fresh air and provide medical oxygen/CPR if needed. Obtain medical attention.

2. Eyes	Immediately flush with water for at least 15 minutes, hold eyelids open. Obtain medical attention.
3. Skin	Flush contacted area with large amounts of water fro at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary.
4. Ingestion	Do not induce vomiting. If conscious drink large amounts of water/milk. Obtain medical attention. Never give anything by mouth to an unconscious person.

SECTION 6 --- FLAMMABILITY DATA

Components	Flash Point	Explosive Limits	Comments
Lead	None	None	
Sulfuric Acid	None	None	
Hydrogen	259°C	4% - 74.2%	Emit hydrogen only if over charged (Voltage>2.4 VPC). To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery. Extinguishing Media: Dry chemical, Foam CO2.
Fiberglass Separator	N/A	N/A	Toxic vapors may be released. In case of fire: wear self-contained breathing apparatus.
ABS	None	N/A	Danger: Vapors may cause Flash Fire. Harmful or Fatal if Swallowed. Vapor Harmful.
PP	None	N/A	Temperatures over 300°C (572°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus.

SECTION 7 --- REACTIVITY DATA

Components	Lead/lead compounds
Stability	Stable
Incompatibility	Potassium, carbides, sulfides, peroxides, phosphorus, sulfurs.
Decomposition Products	Oxides of lead and sulfur.
Condition To Avoid	High temperatures, Sparks and other sources of ignition.

Components	Sulfuric Acid
Stability	Stable at all temperatures
Polymerization	Will not polymerize
Incompatibility	Reactive metals, strong bases, most organic compounds
Decomposition Products	Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen
Conditions To Avoid	Prohibit smoking, sparks, etc. from battery charging area. Avoid mixing acid with other chemicals.

SECTION 8 --- CONTROL MEASURES

1. Store lead/acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.

2. Do not remove vent caps. Follow shipping and handling instructions that are applicable to the battery type. To avoid damage to terminal and seals, do not double-stack industrial batteries.

STEPS TO TAKE IN CASE OF LEAKS OR SPILLS

If sulfuric acid is spilled from a battery, neutralize the acid with sodium bicarbonate (baking soda), sodium carbon (soda ash), or calcium oxide (lime).

Flush the area with water; discard to the sewage systems. Do not allow unneutralized acid into the sewage system.

WASTE DISPOSAL METHOD:

Neutralized acid may be flushed down the sewer. Spent batteries must be treated as hazardous waste and disposed of according to local state, and federal regulations. A copy of this material safety data must be supplied to any scrap dealer or secondary smelter with battery.

ELECTRICAL SAFETY

Due to the battery's low internal resistance and high power density, high levels of short circuit can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only.

Follow all installation instruction and diagrams when installing or maintaining battery systems.

SECTION 9 --- HEALTH HAZARD DATA

LEAD: The toxic effects of lead are accumulative and slow to appear. It affects the kidneys, reproductive, and central nervous system. The symptoms of lead overexposure are anemia, vomiting, headache, stomach pain (lead colic), dizziness, loss of appetite, and muscle and joint pain. Exposure to lead from a battery most often occurs during lead reclaim operations through the breathing or ingestion of lead dusts and fumes.

THIS DATA MUST BE PASSED TO ANY SCRAP OR SMELTER WHEN A BATTERY IS RESOLD.

SULFURIC ACID: Sulfuric acid is a strong corrosive. Contact with acid can cause severe burns on the skin and in the eyes. Ingestions of sulfuric acid will cause GI tract burns. Acid can be released if the battery case is damaged or if the vents are tampered with.

FIBERGLASS SEPARATOR: Fibrous is an irritant of the upper respiratory tract, skin and eyes. For exposure up to 10F/CC use MSA Comfort with type H filter. Above 10F/CC up to 50F/CC use Ultra-Twin with type H filter.

NTP or OSHA does not consider this product carcinogenic.

SECTION 10 --- SULFURIC ACID PRECAUTIONS

STABILITY: Stable Substances to be avoided include water, most common metals, organics materials, strong reducing agents, combustible materials, oxidizing agents, and bases. Reacts violently with water – when diluting concentrated acid, carefully and slowly add acid to water, not the reverse. Reaction with many metals is rapid or violent, and generates hydrogen (flammable, explosion hazard).

INHALATION: Acid mist from formation process may cause respiratory irritation, remove from exposure and apply oxygen if breathing is difficult.

SKIN CONTACT: Acid may cause irritation, burns or ulceration. Flush with plenty of soap and water, remove contaminated clothing, and see a physician if contact area is large or if blisters form.

EYE CONTACT: Acid may cause severe irritation, burns, cornea damage and blindness. Call physician immediately and flush with water until physician arrives.

INGESTION: Acid may cause severe irritation of mouth, throat, esophagus and stomach. Call physician. If patient is conscious, flush mouth with water, have the patient drink milk of sodium bicarbonate solution.

DO NOT GIVE ANYTHING TO AN UNCONSCIOUS PERSON.

SECTION 11 --- TRANSPORTATION REGULATIONS

Identification and Proper Shipping Name:

Batteries –UN2800, Wet, Non-Spillable, Electric Storage

DOT-Unregulated, meets the requirements of 49 CFR 173.159(d)

IATA/ICAO – Unregulated, meets the requirements of Special Provision A48, A67, . PI 872 (DGR 54TH / EDITION)

IMDG – Special Provision 238

Carefree Batteries having met the related conditions are EXEMPT from hazardous goods regulations for the purpose of transportation by DOT, and IATA/ICAO, IMDG, therefore are unrestricted for all modes of transportation Each battery and outer package is labeled "NON-SPILLABLE" and securely packed to prevent short circuiting.

EaglePicher Technologies
Commercial Power Solutions
3220 Industrial Rd
Joplin MO 64801
Phone: 800-201-0215 – Fax: 417-626-2078

Appendix V: Continuous Output Data Streams

A. FORMAT: FAIRBANKS COMPUTER (FBPUTR)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Data String	STX	A	B	C	x	x	x	x	x	x	t	t	t	t	t	t	CR	

x = Displayed weight; Gross or Net
t = Tare Weight
A = Status Word A
B = Status Word B
C = Status Word C

Leading zeros are suppressed.

The following tables define the value of Status Word A, B, and C:

A.1. STATUS WORD A

	DECIMAL POINT OR ZERO LOCATION						
BIT NO.	**X0**	**X**	**0.X**	**0.0X**	**0.00X**	**0.000X**	**0.0000X**
0	1	0	1	0	1	0	1
1	0	1	1	0	0	1	1
2	0	0	0	1	1	1	1

DIVISION SIZE

BIT NO.	**COUNT BY 1**	**COUNT BY 2**	**COUNT BY 5**		
3	1	0		1	
4	0	1		1	
5		Always Logic 1			
6		Always Logic 0			
7		Parity Bit			

A. Format: Fairbanks Computer (FbPutr), Continued

A.2. STATUS WORD B

BIT NO.		DESCRIPTION			
0		Gross = 0		Net = 1	
1		Positive = 0		Negative = 1	
2		In Range = 0		Overcapacity = 1	
3		No Motion = 0		Motion = 1	
4		Lb = 0		Kg = 1	
5		Always Logic = 1			
6		Normal = 0		Power-up = 1	
7		Parity Bit			

A.3. STATUS WORD C

1		DESCRIPTION			
0		Always Logic 0			
1		Always Logic 0			
2		Always Logic 0			
3		Normal = 0		Print Switch Pushed in = 1	
4		Always Logic 0			
5		Always Logic 0			
6		Normal = 0		Keyboard Tare = 1	
7		Parity Pit			

A. Format: Fairbanks Computer (FbPutr), Continued

Character	1	2	3	4	5	6	7	8	9	10
Data String	STX	4	y	x	x	x	x	x	x	ETX

x = weight
y = Second digit of a id code i.e. 4y where y= 0, 1, 3, or 4.
40 = Gross lb, oz, lb-oz, ton, or gallons
41 = Net lb, oz, lb-oz, or ton
43 = Gross kg or grams
44 = Net kg, grams, or gallons

- Underload condition data stops transmitting.
- Overload condition data is transmitted as the id followed by dashes.
- Leading zeros are suppressed.

B. 4. FORMAT : CONSOLIDATED CONTROLS (CONCON)

Character	1	2	3	4	5	6	7	8	9	10
Data String	STX	x	x	x	x	x	x	U	E	CR

x = Displayed weight; Gross or Net
U = Units selected
- **L** = pounds
- **K** = kilograms
- **O** = ounces
- **G** = grams
- **T** = tons or gallons

E = Error flag
- **M** = motion
- **O** = underload or overload
- **Space** = no errors

- Leading zeros are suppressed.
- In a Underload or Overload condition the weight data is suppressed.

C. FORMAT: WEIGHTRONIX (TRONIX)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13
Data String	L	L	x	x	x	x	x	x	sp	U	U	CR	LF

- Variable data string length using gallon units.

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Data String	L	L	x	x	x	x	x	x	sp	U	U	U*	CR	LF

- Variable length using lb/oz units

- **Character 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16**
  Data String L L x x x x x x sp U U U* U* U* CR LF

L = legend
- **spG** = Gross
- **0N** = Net
- **x** = weight
- **sp** = space

U = Units selected

U* = Units selected; these are optional characters which will appear based upon the units displayed. The data string length will vary if these units are selected.

lb = pounds
kg = kilograms
oz = ounces
g = grams
tn = tons
gal* = gallons
lb/oz* = pounds-ounces

- Leading zeros are suppressed.
- In a Underload or Overload condition the weight data and legends are suppressed.
- The first character for a gross data string is a space.

Appendix VI: Demand Output Data Streams

A. FORMAT : COMPUTER POLLED (POLL)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13
Data String	sp	x	x	x	x	x	x	sp	U	U	sp	L	L

x = weight

sp = space

U = Units selected

LB = pounds
KG = kilograms
OZ = ounces
GM = grams
TN = tons
GM = gallons
LB = pounds-ounces

L = legend

GR = Gross
NT = Net

- Leading zeros are suppressed.
- In a Motion condition, the legend will change to lower case.
- In a underload or overload condition, the unit will transmit
- **a --uL-- or a --oL—**
- Polling request is a capital W followed by a carriage return.

B. FORMAT: COMPUTER POLLED WITH ID (POLLID)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13
Data String	sp	x	x	x	x	x	x	sp	U	U	sp	L	L

x = weight
sp = space
U = Units selected
LB = pounds
KG = kilograms

OZ = ounces
GM = grams

TN = tons

GM = gallons
LB = pounds-ounces
L = legend
GR = Gross
NT = Net

- Leading zeros are suppressed.
- In a Motion condition, the legend will change to lower case.
- In a underload or overload condition, the unit will transmit a **--uL-- or a --oL--.**
- Polling request is a **ID**, capital **W**, and followed by a **carriage return**. i.e. **4W(CR)**

Appendix VII: Acc 2860 Communication Wiring

A. PORT A

FROM TB3 IN THE ACC 2860	3550	3950	610	3960	3921	PC DB25	PC DB8
Pin 1 RXA/CTS	20	4	4	2	20	2	3
Pin 2 TXA	3	3	3	3	3	3	2
Pin 3							
Pin 4 GND	7	7	7	7	7	7	5
Pin 5							

FROM TB6 IN THE ACC 2860		RMT 140XA/150X	RMT 160X
Pin 1	20 *(+)	1	1
Pin 2	20 (–)	5	7
Pin 4	GND		
		Jumper Pins	Jumper Pins
		2 to 6	2 to 8

FROM TB6 IN THE ACC 2860	
Pin 2	AI (+) ***
Pin 1	AI (–) ***

* A **22 AWG ground** wire must be connected from the remote to Acc 2860.

** Do not use the **+12V** as a source for **20mA** current loop or **4-20mA** or any other device.

*** **AI = Analog Interface.** The 4-20MA connections are made at this location.

C A U T I O N

The 4-20ma accessory is a passive device!
The power is to be supplied by others, and *MUST BE*
a *DEDICATED* and an *ISOLATED* power supply.

B. PORT B

FROM TB2 IN THE ACC 2860	220	3550	3950	610	3960	3921	PC DB25	PC DB8
Pin 1 RXA/CTS	20	20	4	4	2	20	2	3
Pin 2 TXA	3	3	3	3	3	3	3	2
Pin 3								
Pin 4 GND	7	7	7	7	7	7	7	5
Pin 5								

FROM TB5 IN THE ACC 2860	FUTURE USE
Pin 1 (+)12V *	For future usage.
Pin 2 ENI	
Pin 3 PCO	
Pin 4 PCI	
Pin 5 GND	

*Do not use the +12V as a source for 20 MA current loop or 4-20mA or any other device.

PRINTER CABLES

- Acc 1295 (15597) used on 3550, 3921 and 220 printers.
- Acc 1296 (15598) used on 610 and 3950 printers.
- Acc 1297 (15599) used on 3960 printers.

Appendix VIII: ASCII Codes

HEX	DEC	CHAR
00	000	NUL
01	001	SOH
02	002	STX
03	003	ETX
04	004	EOT
05	005	ENQ
06	006	AKC
07	007	BEL
08	008	BS
09	009	HT
0A	010	LF
0B	011	VT
0C	012	FF
0D	013	CR
0E	014	S0
0F	015	S1
10	016	DLE
11	017	DC1
12	018	DC2
13	019	DC3
14	020	DC4
15	021	NAK
16	022	SYN
17	023	ETB
18	024	CAN
19	025	EM
1A	026	SUB
1B	027	ESC
1C	028	FS
1D	029	GS
1E	030	RS
1F	031	US
20	032	Space
21	033	!
22	034	“
23	035	#
24	036	$
25	037	%
26	038	&
27	039	‘
28	040	(
29	041	)
2A	042	*
2B	043	+
2C	044	,
2D	045	_
2E	046	.
2F	047	/
30	048	0
31	049	1
32	050	2
33	051	3
34	052	4
35	053	5
36	054	6
37	055	7
38	056	8
39	057	9
3A	058	:
3B	059	;
3C	060	<
3D	061	=
3E	062	>
3F	063	?
40	064	@
41	065	A
42	066	B
43	067	C
44	068	D
45	069	E
46	070	F
47	071	G
48	072	H
49	073	I
4A	074	J
4B	075	K
4C	076	L
4D	077	M
4E	078	N
4F	079	O
50	080	P
51	081	Q
52	082	R
53	083	S
54	084	T
55	085	U
56	086	V
57	087	W
58	088	X
59	089	Y
5A	090	Z
5B	091	[
5C	092	\
5D	093	]
5E	094	^
5F	095	-
60	096	`
61	097	a
~ 62	098	b
63	099	c
64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	I
6A	106	j
6B	107	k
6C	108	l
6D	109	m
6E	110	n
6F	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7A	122	z
7B	123	{
7C	124	|
7D	125	}
7E	126	~
7F	127	Delete

2800 Series

Intrinsically Safe Instrument

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