

L-847 Circuit Selector Switch

All Types, Classes, and Ratings

Operation Manual

96A0204

Retain for future use.

Rev. G, 8/9/11

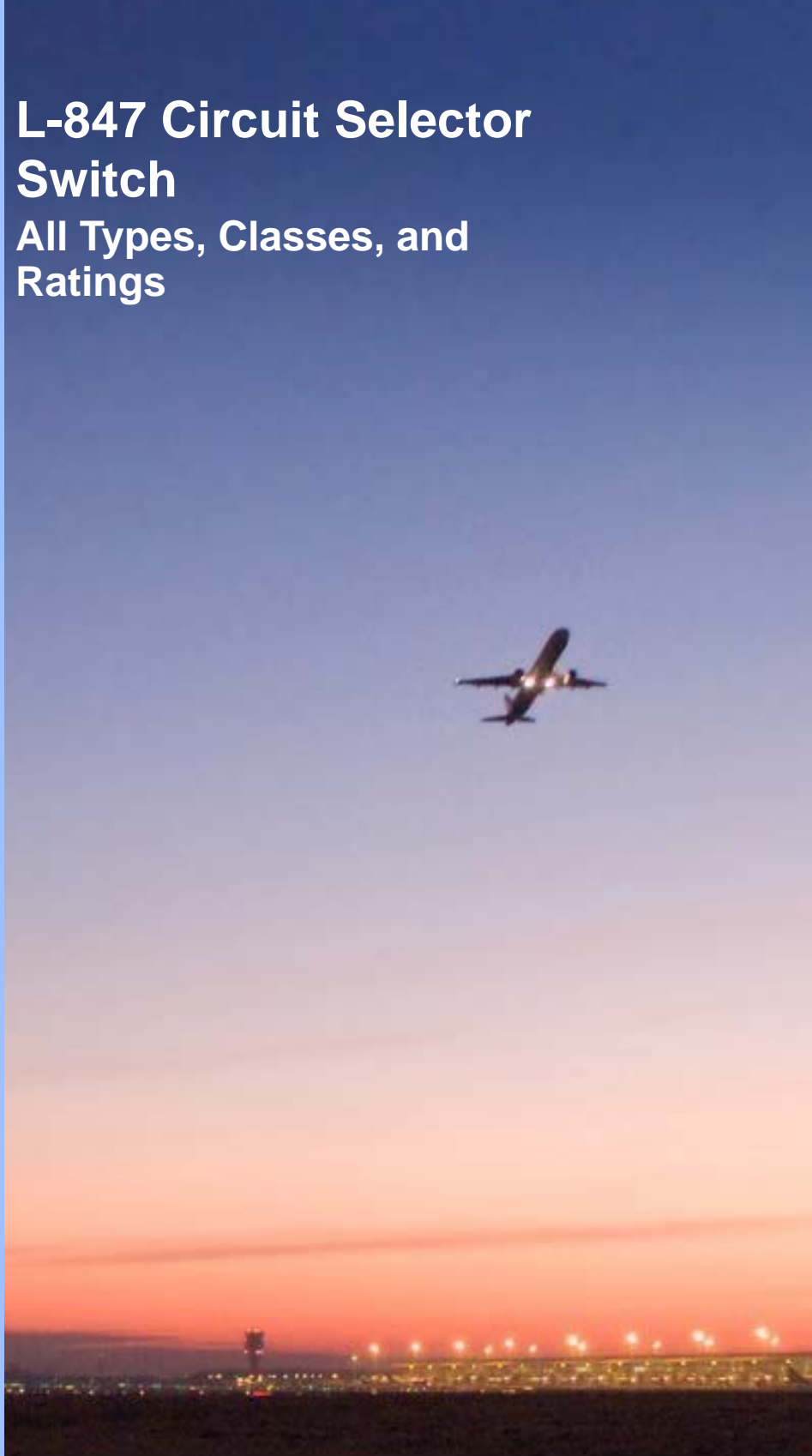


Compliance with Standards

FAA: L-847 AC 150/5345-5 (Current Edition)

ETL Certified

ICAO: In compliance with ICAO Aerodrome Design Manual, Part 5, para. 3.2.1.3



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TABLE OF CONTENTS

- L-847 Circuit Selector Switch i

- 1.0: Safety** 1
- 1.1 :To use this equipment safely: 1
 - 1.1.1 :Additional Reference Materials: 1
 - 1.1.2 :Qualified Personnel 1
 - 1.1.3 :Intended Use 1
 - 1.1.4 :Storage 1
 - 1.1.4.1 :Operation 2
 - 1.1.4.2 :Material Handling Precautions 2
 - 1.1.4.3 :Action in the Event of a System or Component Malfunction 2
 - 1.1.4.4 :Maintenance and Repair 2

- 2.0: Circuit Selector Switch** 3
- 2.1 :About this manual 3
 - 2.1.1 :How to work with the manual 3
 - 2.1.2 :Record of changes 3
 - 2.1.3 :Icons used in the manual 3
 - 2.1.4 :Features 4
 - 2.1.5 :Support 4
 - 2.1.5.1 :Customer Service 4
 - 2.1.5.2 :Hotline 4
 - 2.1.5.3 :Preventative Maintenance 4
- 2.2 :System Overview 5
 - 2.2.1 :Electrical 5
 - 2.2.2 :Operating Conditions 5
- 2.3 :Theory of Operation 6
 - 2.3.1 :General 6
 - 2.3.2 :External Connectors and Local Control 7
 - 2.3.3 :High Voltage Relay Switching 7
 - 2.3.3.1 :Loop Energizing Steps 7
 - 2.3.3.2 :Loop De-energizing Steps 7
 - 2.3.4 :Interlock Switch (Optional) 7
 - 2.3.5 :Monitor (Optional) 7
 - 2.3.6 :Reverse L-847 (Optional) 8
 - 2.3.7 :L-847 Circuit Selector Switch: Required Equipment 9
- 2.4 :Specifications 10
 - 2.4.1 :Power Requirements 10
 - 2.4.2 :Dimensions 10
- 2.5 :Installation 11
 - 2.5.1 :Introduction 11
 - 2.5.2 :Unpacking 11
 - 2.5.3 :Mounting 11
- 2.6 :Wiring 12
 - 2.6.1 :Installing Interlock Switch (Optional) 13
 - 2.6.2 :Installing Monitor (Optional) 14
- 2.7 :Operation 16
 - 2.7.1 :Energizing Series of Lighting Loops Using Local Control 17
 - 2.7.2 :Energizing Series of Lighting Loops Using Remote Control 17
 - 2.7.3 :Switching from One Loop to Another Using Local Control 17
 - 2.7.4 :Switching from One Loop to Another Using Remote Control 17
 - 2.7.5 :Turning On/Off Lamp Status Indicator 18
- 2.8 :Maintenance 19

Table of Contents

| | |
|---|-----------|
| 2.9 :Troubleshooting | 20 |
| 3.0: Wiring Schematics and Mechanical Drawings | 21 |
| Document Date (12/2010) | 40 |

1.0 Safety

This section contains general safety instructions for installing and using ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 To use this equipment safely:



WARNING

Read installation instructions in their entirety before starting installation.

- Refer to the FAA Advisory Circular AC 150/5340-26, Maintenance of Airport Visual Aids Facilities, for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always disconnect power before making any wiring connections or touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

1.1.1 Additional Reference Materials:

- NFPA 70B, Electrical Equipment Maintenance.
- NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- OSHA 29 CFR, Part 1910, Occupational Health and Safety Standards.
- National and local electrical codes and standards.

1.1.2 Qualified Personnel

The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements.

Always use required personal protective equipment (PPE) and follow safe electrical work practices.

1.1.3 Intended Use



WARNING

Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

ADB Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death or property and equipment damage. Unintended uses may result from taking the following actions:

- Making changes to equipment that are not recommended or described in this manual or using parts that are not genuine ADB Airfield Solutions replacement parts.
- Failing to make sure that auxiliary equipment complies with approval-agency requirements, local codes and all applicable safety standards.
- Using materials or auxiliary equipment that are inappropriate or incompatible with ADB Airfield Solutions equipment.
- Allowing unqualified personnel to perform any task.

1.1.4 Storage



CAUTION

If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in injury or equipment damage.

1.1.4.1 Operation



WARNING

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

1.1.4.2 Material Handling Precautions



CAUTION

- This equipment may contain electrostatic sensitive devices.
- Protect from electrostatic discharge.
 - Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
 - Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
 - Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
 - The tip of the soldering iron must be grounded.
 - Electronic modules and components must be stored and transported in conductive packing.

1.1.4.3 Action in the Event of a System or Component Malfunction



WARNING

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

1.1.4.4 Maintenance and Repair



WARNING

- Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.
- Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.
 - Disconnect and lock out electrical power.
 - Always use safety devices when working on this equipment.
 - Follow the recommended maintenance procedures in the product manuals.
 - Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
 - Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
 - Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
 - Check interlock systems periodically to ensure their effectiveness.
 - Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
 - Use tools with insulated handles when working with electrical equipment.

2.0 Circuit Selector Switch

L-847 Circuit Selector Switch Installation Manual.

Uses: The circuit selector switch is used to switch the output of a constant current regulator (CCR) to one to four series lighting loops.

2.1 About this manual

The scope of this manual is to describe and familiarize the end user with the operation of the Circuit Selector.

2.1.1 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.



2.1.2 Record of changes

| Page | Rev | Description | EC No. | Checked | Approved | Date |
|--------------|-----|---|--------|---------|----------|----------|
| | A | Initial release. | 2868 | JH | WT | 4/3/97 |
| | B | Added monitor option. | 3035 | TN | TN | 8/20/97 |
| 7, 15, 31-33 | C | Updated Figure 5 and added quantities to parts lists. | 00291 | TN | ED | 10/12/99 |
| 29 | D | Updated parts section introduction to remove numbers in parts list because numbers were being misinterpreted. | 00597 | JY | WT | 11/10/00 |
| All | E | Changed to new title page. Changed ADB to ADB Airfield Solutions. | 00696 | JY | WT | 5/16/01 |
| All | F | Added L847R and updated manual | 01346 | JR | ED | 1/20/05 |
| All | G | Added parts and schematics | 3353 | RW | JC | 8/09/11 |
| | | | | | | |
| | | | | | | |

2.1.3 Icons used in the manual

For all WARNING symbols see the Safety section.

Carefully read and observe all safety instructions in this manual, which alert to personal safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

| | |
|---|--|
|  | <p>WARNING</p> <ul style="list-style-type: none"> • Failure to observe a warning may result in personal injury, death or equipment damage. |
|  | <p>CAUTION</p> <ul style="list-style-type: none"> • Failure to observe a caution may result in equipment damage. |

About this manual

2.1.4 Features

- Easy installation and operation
- All solid-state-type switching control to activate reliable output vacuum relays
- Operated from remote or local control
- Up to four circuit selector switches available in a single unit
- Rated for 5,000V at 6.6A or 20A

2.1.5 Support

2.1.5.1 Customer Service

Should you have questions regarding usage of the system described in this manual, contact your ADB Airfield Solutions representative in Columbus/Ohio.

ADB Airfield Solutions Customer Service and Sales teams are made up of well/trained and knowledgeable personnel who are ready to provide immediate response and support for all of our customers needs.

2.1.5.2 Hotline

The ADB Airfield Solutions Service Team provides 24/hour, 7-days-a-week technical support. To reach our Service Team, call (800) 545-4157 and press 1. The ADB Service Team also provides on-site technical support as required.

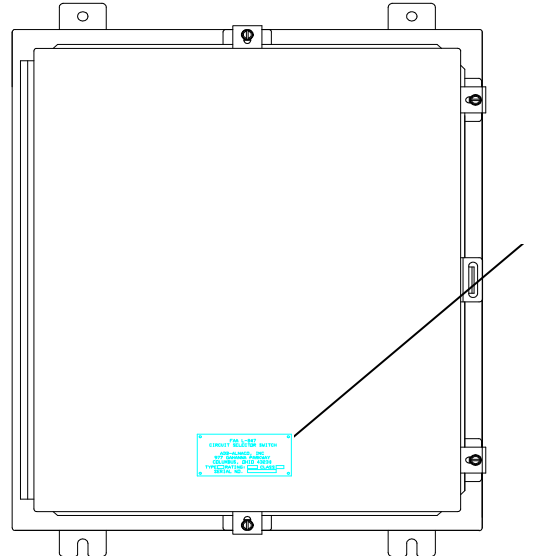
2.1.5.3 Preventative Maintenance

The ADB Airfield Solutions Service Team also provides preventative maintenance programs that are custom tailored for specific airport equipment. Contact the Service Team for more information and available PM options.

2.2 System Overview

This section describes the ADB Airfield Solutions L-847 circuit selector switch. The L-847 circuit selector switches are designed to switch the output of a 6.6 A or 20 A constant current regulator to one or more series runway lighting loops.

Figure 1: Standard L-847 Circuit Selector Switch with Nameplate (1)



System Overview

Refer to Table 1, Table 2, and Table 3. The L-847 circuit selector switches are classified according to FAA type, class, and rating. Figure 1 shows the location of the nameplate (1) containing information about type, rating, and class. The L-847 circuit selector switches are manufactured to specification AC 150/5345-5A as follows:

Table 1: FAA Type

| Type | Function |
|---------|-----------------------|
| L-847-1 | One-circuit control |
| L-847-2 | Two-circuit control |
| L-847-3 | Three-circuit control |
| L-847-4 | Four-circuit control |

Table 2: FAA Class

| Class | Function |
|-------|--------------------------|
| A | Designed for indoor use |
| B | Designed for outdoor use |

Table 3: FAA Rating

| Rating | Function |
|--------|---|
| 1 | Designed for 6.6 A, 5,000 volt circuits |
| 2 | Designed for 20 A, 5,000 volt circuits |

2.2.1 Electrical

Input voltage: 120V AC, +10%, 60Hz

Output rating: 5,000V AC at 6.6A or 20A

2.2.2 Operating Conditions

Temperature: -40°F to +131°F (-40°C to +55°C)

Humidity: 0 to 100%

Altitude: 0 to 10,000 feet (3,000 m)

2.3 Theory of Operation

2.3.1 General

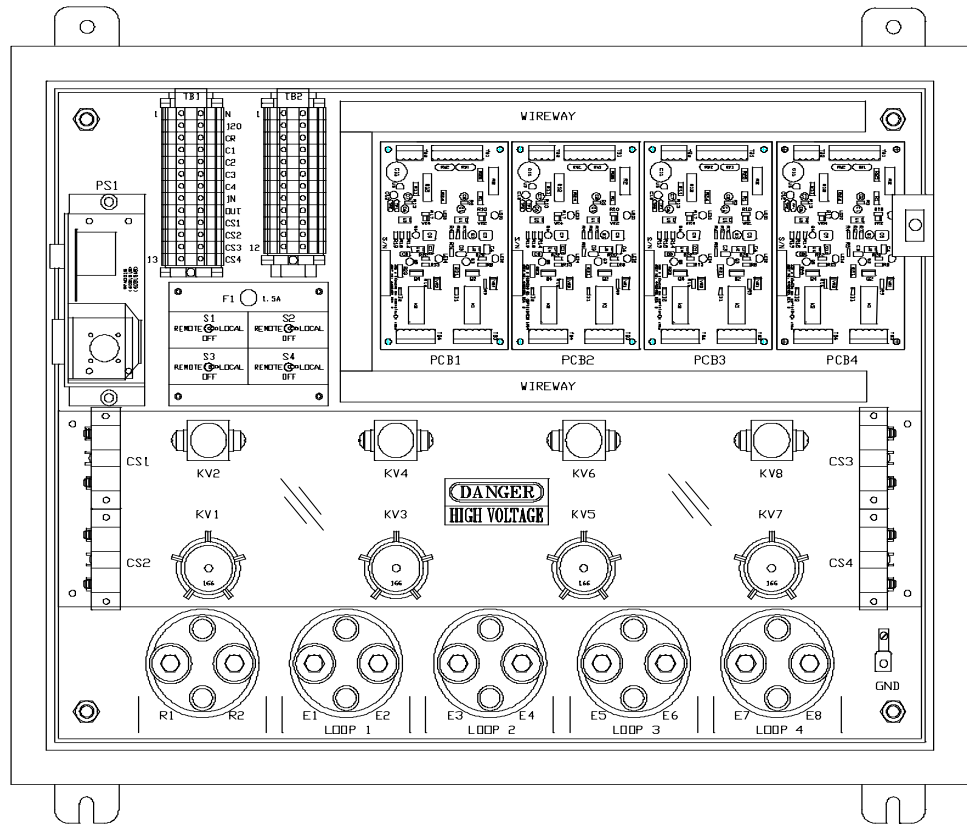
The L-847 circuit selector switch is designed to switch the output of a 6.6 A or 20 A constant current regulator (CCR) to one, two, three, or four series lighting loops using remote or local control. Turning off the L-847 from remote or local control short-circuits the CCR output and disconnects all series lighting loops from the CCR output.

See Figure 2. Each L-847 series lighting circuit control is identical and consists of a time delay relay PCB (Item 5), a Remote/Off/Local switch (Item 13), and a set of high voltage vacuum relays (Item 7). The Remote/Off/Local switch activated the time delay PCB, which controls the set of high voltage vacuum relays. Relays KV2, 4, 6 and 8 short or engage the constant current regulator while relays KV1, 3, 5 and 7 connect or disconnect the series lighting loops. A 24VDC power supply (Item 15) powers the coils of the high voltage vacuum relays and the time delay PCBs.

See Internal Wiring in the Wiring Schematic section for internal wiring connections for all four FAA types of circuit selector switches and for the L-847 Reverse type of circuit selector switch.

NOTE: In Figure 2, the four-circuit selector switch is used to show representative parts for all four types of selector switches.

Figure 2: Four-Circuit Selector Switch (Internal View)



| | | |
|-------------------------------|--------------------------------------|---------------------------|
| 1. TB1 Terminal C1 | 2. Interlock Switch | 3. Current Sensing Relays |
| 4. TB1 Terminal CR | 5. Vacuum Relays KV1-KV8 | 6. High Voltage Relay |
| 7. TB1 Terminal 120 (120 Vac) | 8. Series Loops 1 thru 4 | 9. Control Switch S1 |
| 10. TB1 Terminal N (Neutral) | 11. Input Terminals from CCR Outputs | 12. Fuse F1 |
| 13. Time Delay Relay PCB | 14. High Voltage Relay | 15. 24Vdc Power Supply |
| 16. Plexiglas Shield | | |

2.3.2 External Connectors and Local Control

See Figure 2 and “Wiring Schematics and Mechanical Drawings” on page 21. 120Vac input power is connected to TB1 terminals “120” and “N”. The 120 Vac line is taken through fuse F1 (Item 14) and then to the local connection on switch S1 (Item 13). When S1 is in the LOCAL position, 120 Vac is taken to the time delay relay PCB (Item 5). This PCB is used to control the proper sequence of operation of the high voltage vacuum relays (Item 7). The 120 Vac is also taken to TB1 terminal to be used for remote control switching. If S1 is in the REMOTE position and a connection is made externally from terminal CR to terminal C1, then 120 Vac is taken to the time delay relay PCB.



CAUTION

The L-847 is designed to turn on one circuit at a time. If the regulator is sized properly to cover the circuits, more than one circuit can be switched on at a time. If the regulator is not large enough and more than one circuit is switched on at the same time, the regulator may be damaged.

NOTE: The external connection from CR to C1, C2, C3, or C4 should be a relay or switch contact only. Terminal CR cannot drive an external load.

2.3.3 High Voltage Relay Switching

2.3.3.1 Loop Energizing Steps

See Figure 2. Placing the L-847 internal switch S1 in the LOCAL position or activating Loop 1 through remote control causes 120 Vac to be applied to the time delay PCB1 (Item 5) which causes the following sequence of actions to occur:

The “off” time delay relay on PCB1 is immediately energized. This applies +24VDC to the coil of high voltage vacuum relay KV1 (Item 10).

KV1 energizes and connects both terminals of Loop 1 to the CCR input terminals R1 and R2 (Item 9) which, at this point, are still shorted through KV2 (Item 12).

Approximately one second after 120 Vac is applied to the time delay PCB1, it’s “on” relay energizes.

This applies +24VDC to the coil of high voltage vacuum relay KV2.

KV2 energizes, opening it’s contacts and allowing current to flow through KV1 to Loop 1.

In summary, actions 1 through 4 connect the field loop to the shorted regulator output and then disconnect the short to allow current to flow in to the lighting loop. This prevents an open circuit on the output of the CCR

2.3.3.2 Loop De-energizing Steps

See Figure 2. Placing the internal control switch S1 in the OFF position or opening the remote control switch causes 120 Vac to be removed from the time delay PCB1 (Item 5). This causes the following sequence of actions to occur:

The “on” time delay relay on PCB1 is de-energized. This removes +24VDC from the coil of high voltage vacuum relay KV2 (Item 12).

KV2 de-energizes and places a short across both terminals of Loop 1 and the CCR input terminals R1 and R2.

Approximately one second after 120 Vac is removed from the time delay relay PCB1, it’s “off” time delay relay de-energizes. This removes +24VDC from the coil of high voltage vacuum relay KV1 (Item 10).

KV1 de-energizes, disconnecting Loop 1 from input terminals R1 and R2.

In summary, actions 1 through 4 place a short across the CCR output (terminals R1 and R2), preventing an open circuit on the output of the CCR, and then disconnects the lighting loop.

2.3.4 Interlock Switch (Optional)

The interlock switch is an optional feature that will de-energize the CCR when the L-847 enclosure door is open. This will ensure extra personnel safety when the L-847 is repaired.

2.3.5 Monitor (Optional)

The optional monitoring feature allows the user to monitor the L-847 operational status. This status includes the following:

- Circuit is in remote or local

2.3.6 Reverse L-847 (Optional)

- Current is or is not flowing in each loop

The Reverse L-847 is an optional build of the L-847-2 that enables the user to supply current to one series lighting loop from one of two constant current regulators (CCR). The Reverse L-847 is only available in the FAA Type L-847-2 configuration.

The Reverse L-847 is designed to switch between the output of two CCRs, routing the selected CCR's output to one series lighting loop. Turning off the Reverse L-847 from Remote or Local short-circuits the CCR outputs and disconnects the series lighting loop from the CCR outputs.

The Reverse L-847 is constructed identically to a standard L-847-2 and is available with the Interlock Switch and Monitoring options. It's difference is in how the unit is wired internally and the labeling of the high voltage standoffs which are used to terminate the CCR outputs and the series lighting loop (See Figure 5 and Figure 18 –wiring diagram).

Loop energizing/de-energizing steps and relay operations are identical to a standard L-847. However, due to the wiring difference in a Reverse L-847 there is a different result when energizing or de-energizing a CCR's output. Following are summaries of the energizing and de-energizing steps of CCR 1 and LOOP 1.

Loop Energizing Summary

- Placing internal switch S1 in the LOCAL position or activating through remote control routes the output of CCR 1 to LOOP 1 by shorting KV1 and then opening KV2. CCR 2 remains shorted through KV4 and disconnected from LOOP 1 through KV3.

Loop De-energizing Summary

- Placing internal switch S1 in the OFF position or de-activating through remote control disconnects the output of CCR 1 from LOOP 1 by shorting KV2 and then opening KV1. CCR 2 remains shorted through KV4 and disconnected from LOOP 1 through KV3.



CAUTION

- The Reverse L-847 is designed to route one CCR at a time to the series lighting loop. Once a CCR's output is routed to LOOP 1, the second CCR cannot be routed to LOOP 1 until the active CCR's circuit control switch (S1 or S2) is turned to the OFF position.
- Although the Reverse L-847 is designed to allow both constant current regulators to run simultaneously, it is NOT RECOMMENDED. A catastrophic failure of the Reverse L-847 (for instance, through a direct lightning strike) could result in both CCR outputs being tied together.

2.3.7 L-847 Circuit Selector Switch: Required Equipment

Refer to Table 4 for required equipment that is supplied. Refer to Table 5 for required equipment that is not supplied. Refer to the *Parts* section for ordering information.

Table 4: Required Equipment Supplied

| Description | Quantity |
|-------------------------------|-------------|
| L-847 circuit selector switch | 1 |
| Instruction manual | 1 per order |

Table 5: Required Equipment Not Supplied

| Description | Quantity |
|---|-------------|
| Support fixtures, including frangible coupling, if needed | 1 |
| Padlock, for the enclosure | 1 |
| Wire, input power | As required |
| Wire, remote control | As required |
| Switch or relay for external remote control | As required |

2.4 Specifications

This subsection describes the specifications for the four types of L-847 circuit selector switches: L-847-1, L-847-2, L-847-3, and L-847-4. Specifications for these four types are the same except for power requirements, dimensions, and weights. Refer to the *Parts* section for part numbers.

2.4.1 Power Requirements

Refer to Table 6 for power requirement differences in the four types of circuit selector switches.

Table 6: Power Requirements According to Type

| Type | Maximum Volt-Amp (VA) Load |
|---------|----------------------------|
| L-847-1 | 150 |
| L-847-2 | 160 |
| L-847-3 | 170 |
| L-847-4 | 180 |

2.4.2 Dimensions

Refer to Table 7 for the dimensions of the four types of circuit selector switches.

Table 7: Dimensions According to Type and Weight

| Type | H x W x D in (cm) | Weight lb (kg) |
|----------------------------------|--|-------------------|
| Standard Steel Enclosure | | |
| L-847-1 | 20 x 24 x 10 (50.8 x 61 x 25.4) | 50 (22.7) |
| L-847-2 | 20 x 24 x 10 (50.8 x 61 x 25.4) | 54 (24.5) |
| L-847-3 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 71 (32.2) |
| L-847-4 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 75 (34) |
| Stainless Steel Enclosure | | |
| L-847-1 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 62.5 (28.4) |
| L-847-2 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 66.5 (30.2) |
| L-847-3 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 83.5 (38.0) |
| L-847-4 | 24 x 30 x 10 (61 x 76.2 x 25.4) | 87.5 (39.8) |
| Fiberglass Enclosure | | |
| L-847-1 | 20.6 x 27.1 x 10 (52.3 x 68.8 x 25.4) | 31 (14.1) |
| L-847-2 | 20.6 x 27.1 x 10 (52.3 x 68.8 x 25.4) | 35 (15.9) |
| L-847-3 | 30.7 x 39.2 x 10 (78 x 99.6 x 25.4) | 70.5 (32.0) |
| L-847-4 | 30.7 x 39.2 x 10 (78 x 99.6 x 25.4) | 74.5 (33.9) |

2.5 Installation



WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

2.5.1 Introduction

This section provides instructions for installing the L-847 circuit selector switch.

2.5.2 Unpacking

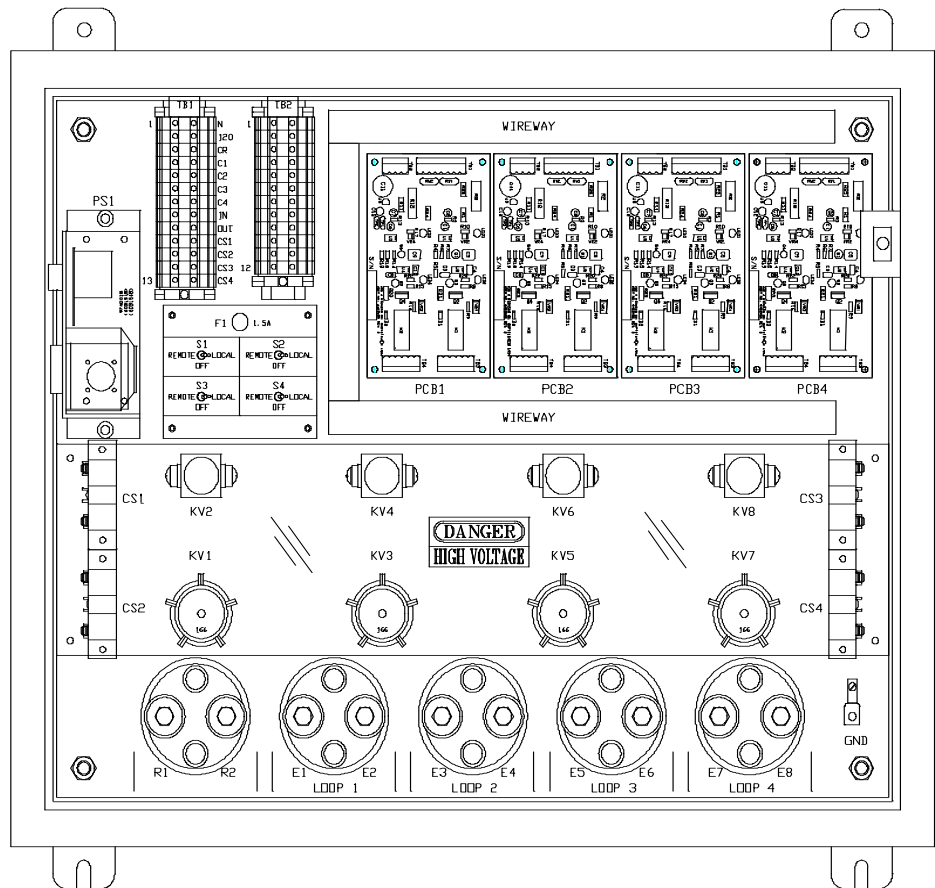
Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

2.5.3 Mounting

See Figure 3. The enclosure has four mounting tabs, two located at the top and two at the bottom. Mount the control panel on fabricated mounting legs or wall-mount with appropriate hardware for the surface to which the panel is mounted. The panel enclosure is a NEMA 4 type and can be used indoors or outdoors. Refer to project plans and specifications for appropriate mounting details.

Figure 3: L-847 Mounting and Wiring



| | | |
|-------------------------|---------------------------|---------------------|
| 1. Top Mounting Tabs | 2. Loops 1–4 | 3. Retaining Screws |
| 4. TB1 | 5. Terminals R1 and R2 | 6. Switches S1–S4 |
| 7. Interlock Switch | 8. Plexiglas Shield | |
| 9. Bottom Mounting Tabs | 10. Current Sensing Relay | |

2.6 Wiring



WARNING

Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage

Refer to “Wiring Schematics and Mechanical Drawings” on page 21 for wiring connections. When connecting wiring to the L-847 control panel, follow the guidelines below:

Place constant current regulator (CCR), series lighting loop, and earth ground wiring through the two two-inch holes in the bottom of the control box using the proper hardware.

Place the power and remote control wires through the one-inch hole in the bottom of the control box.

All high voltage regulator and series lighting circuit wiring should be a minimum AWG 8, 5,000 volt insulation L-824 series loop wiring.

Attach the CCR and series lighting loop wires to the terminal provided on each high voltage insulator.

Connect a good earth ground, minimum AWG 8, to the earth ground stud on the enclosure panel.

Route the power wiring (14 AWG, 600 V) and remote control wiring (16 AWG, 600 V) from the one-inch hole on the panel bottom to the terminal block TB1. Refer to Figure 15.

NOTE: The external connection from CR to C1, C2, C3, or C4 should be a relay or switch contact only. Terminal CR cannot drive an external load. CR is 120 Vac supplied internally.

To install the L-847 wires, perform the following procedure:

See Figure 2. Place switches S1 through S4 (Item 13) in the OFF position.

Remove the four retaining screws that hold the Plexiglas high voltage shield (Item 16) and remove the shield.



CAUTION

If you have porcelain insulators, exercise care when tightening the 1/4–20 hex nut on the top of the porcelain insulators since they can be easily cracked if excessive torque is applied.

Connect the output of the CCR to input terminals R1 and R2 (Item 9) of the L-847.

Connect the output terminals of the L-847 selector switch, Loop 1 through Loop 4 (Item 8), to the desired lighting circuits. Ensure that the wiring layout is neat and that adjacent insulators do not have any metal parts that are close to one another.

Check insulator wiring connections to ensure that both internal and external wires are not loose.

Replace the Plexiglas cover and retaining screws.

Connect power and remote control wiring to terminal block TB1 (Item 2) per figure 15.

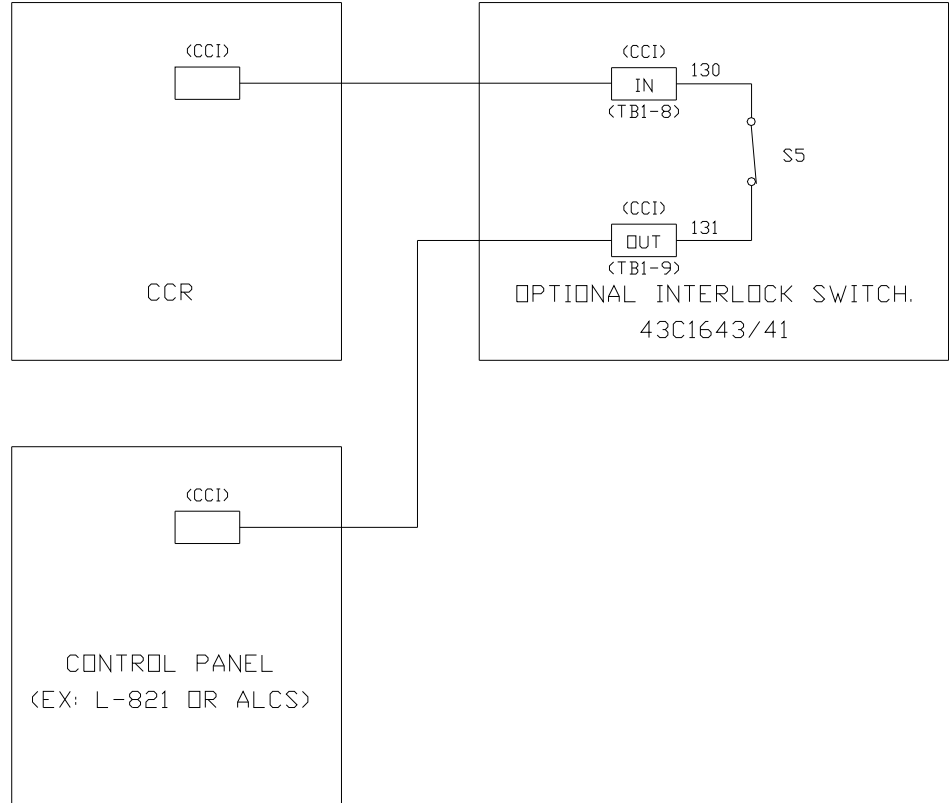
2.6.1 Installing Interlock Switch (Optional)

To install the optional interlock switch, perform the following procedure:

See Figure 4.

Connect the CCR remote control CCI wire from the regulator to TB1-8 of the L-847.

Figure 4: Installing Interlock Switch



Wiring

Connect the wire from TB1-9 to the control panel.

NOTE: The ALCS or L-821 control panel controls the CCR remote control.

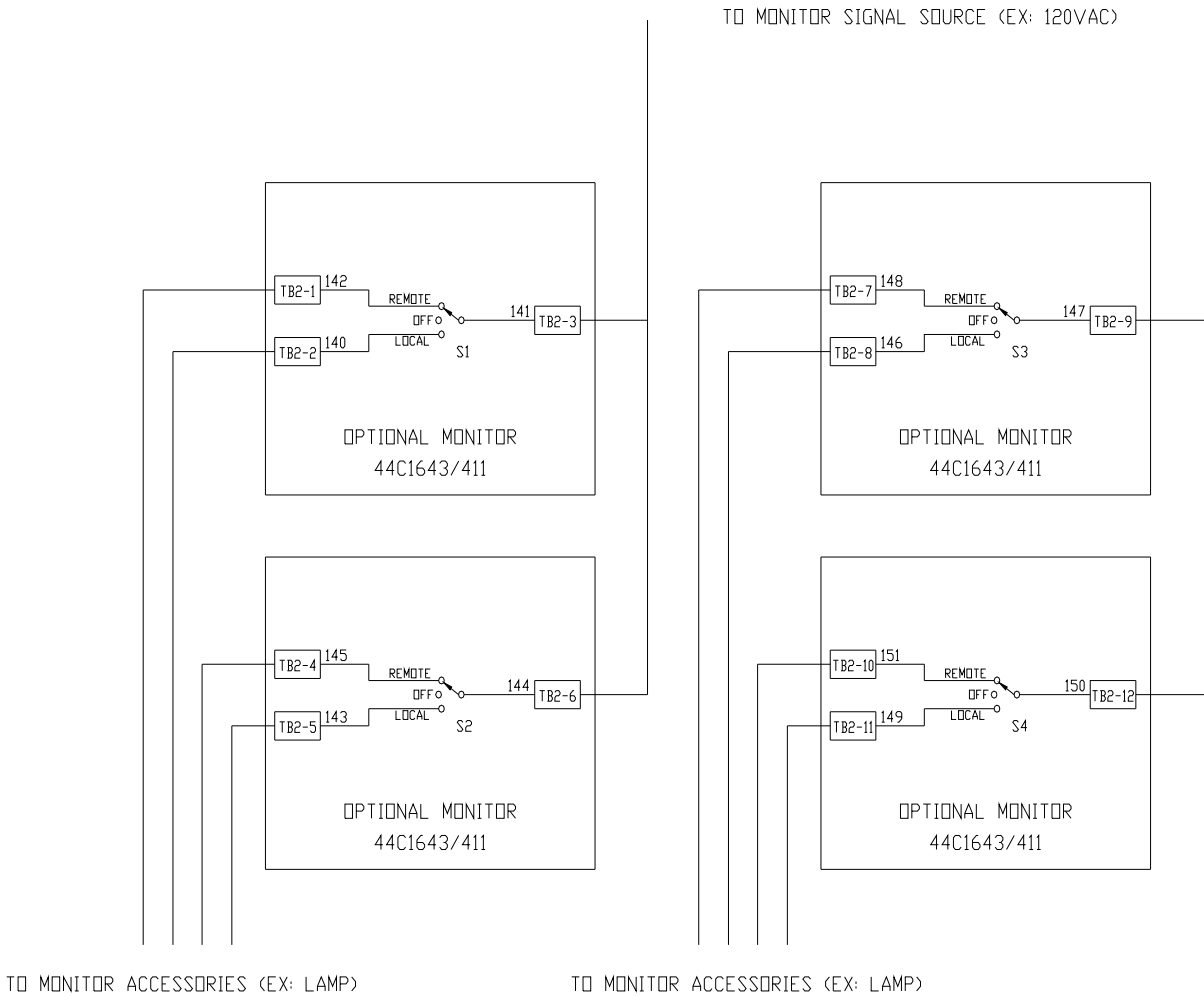
2.6.2 Installing Monitor (Optional)

To install the optional monitoring, perform the following procedure:

Remote/Local Feedback Monitoring

See Figure 5. Connect the monitor signal source for loop 1 to TB2-3. Connect accessory (lamp or buzzer), to TB2-1 for remote monitor and TB2-2 for local monitoring. The accessory used to monitor the remote or local status must also be tied to the common of the source voltage.

Figure 5: Installing Monitoring Remote/Local Feedback



Repeat Step 1 for the remaining loops in the table below.

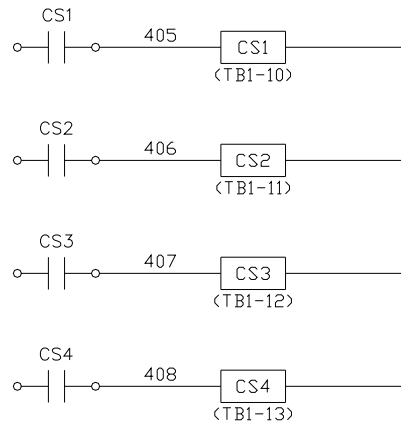
| Loop | Connection |
|--------|--|
| Loop 2 | SIGNAL to TB2-6 REM to TB2-4 LOCAL to TB2-5 |
| Loop 3 | SIGNAL to TB2-9 REM to TB2-7 LOCAL to TB2-8 |
| Loop 4 | SIGNAL to TB2-12 REM to TB2-10 LOCAL to TB2-11 |

Energized field circuit feedback

See Figure 6. Connect the accessory wire to the terminal block connections shown in the table below.

| Energized Loop | Accessory Connection to: |
|----------------|--------------------------|
| Loop 1 | TB1-10 |
| Loop 2 | TB1-11 |
| Loop 3 | TB1-12 |
| Loop 4 | TB1-13 |

Figure 6: Accessory Wire Connections



TO MONITOR ACCESSORIES (EX: LAMP)

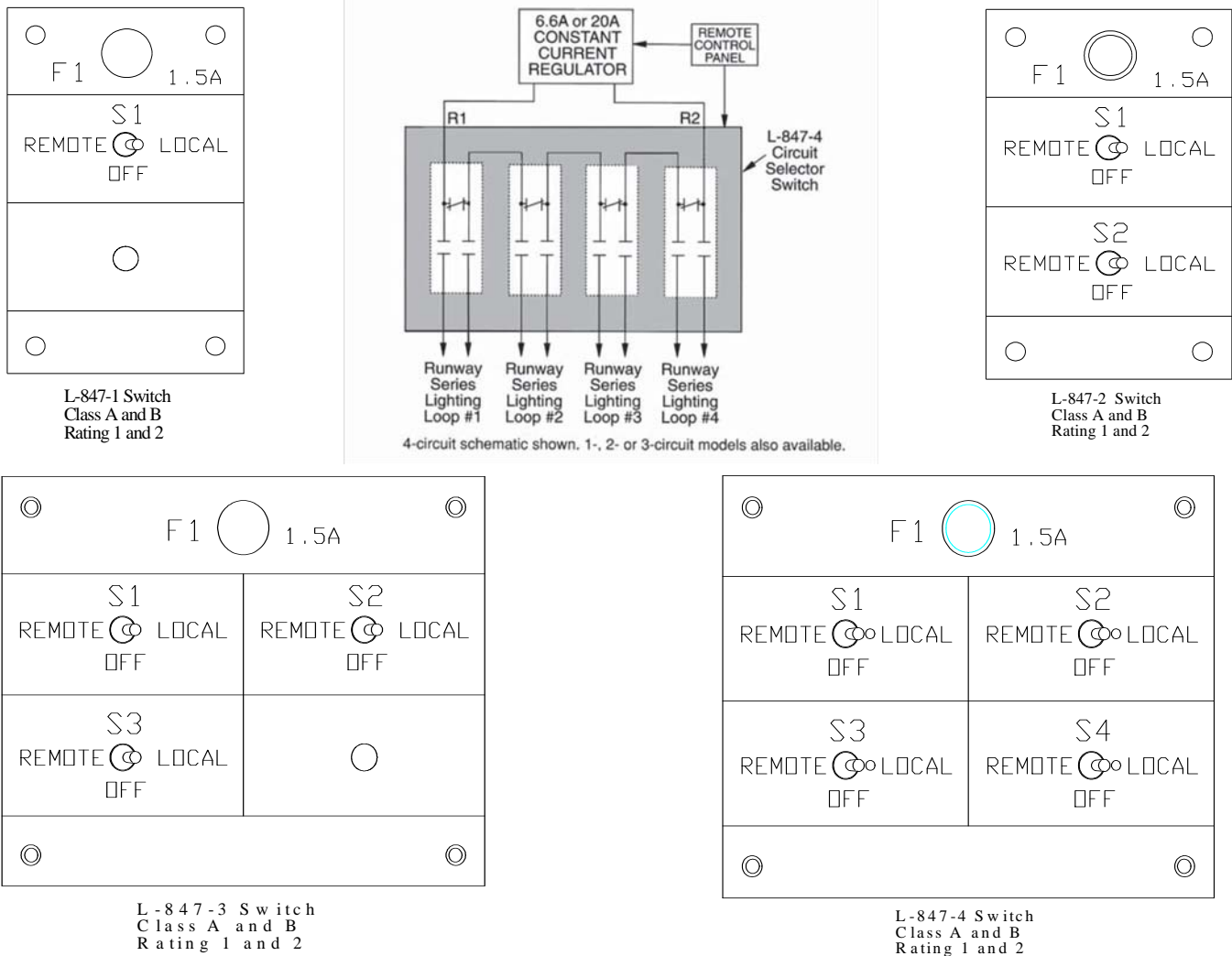
2.7 Operation

This section describes the following operational procedures for the L-847 circuit selector switch:

- Energizing series of lighting loops using local control
- Energizing series of lighting loops using remote control
- Switching from one loop to another using local control
- Switching from one loop to another using remote control

The L-847 circuit selector switch provides remote or local control. The number of control switches used may vary from one to four depending upon the type of L-847's being used. Each circuit is identical to the others in its operation. See Figure 7 for the remote and local switches and protective fuses for all four types of L-847s.

Figure 7: Control Switches



Refer to Table 8 for definitions of control switch functions.

Table 8: Control Switch Functions

| Switch Position | Function |
|-----------------|---|
| REMOTE | Allows circuit selection to be controlled from an external location such as an air traffic control tower or a manager's office. |
| OFF | Shorts the constant current regulator's output and opens the assigned lighting circuit. |
| LOCAL | Turns on the lighting circuit corresponding to the switch number selected |

2.7.1 Energizing Series of Lighting Loops Using Local Control

To use local control to energize a series of lighting loops, perform the following procedure:

See Figure 7. Place any switch that is in the LOCAL or REMOTE position in the OFF position.

Turn on the constant current regulator.

After approximately two seconds, place the appropriate switch, S1, S2, S3, or S4, in the LOCAL position.

Wait approximately two seconds and verify that the selected loop is energized.

2.7.2 Energizing Series of Lighting Loops Using Remote Control

To use remote control to energize a series of lighting loops, perform the following procedure:

See Figure 7. Place any switch in the LOCAL or REMOTE position in the OFF position.

Turn on the constant current regulator.

After approximately two seconds, place the appropriate switch, S1, S2, S3, or S4, in the REMOTE position.

Connect the remote wiring to terminal block TB1 as follows:

- Terminal CR to C1 to energize Loop 1.
- Terminal CR to C2 to energize Loop 2.
- Terminal CR to C3 to energize Loop 3.
- Terminal CR to C4 to energize Loop 4.

Wait approximately two seconds and verify that the selected loop is energized.

2.7.3 Switching from One Loop to Another Using Local Control

To switch the output of an L-847 circuit selector switch from one series lighting loop to another using local control, perform the following procedure:

See Figure 7. Place the switch controlling the series lighting loop currently energized in the OFF position.

Wait approximately two seconds.

Place the switch controlling the series lighting loop that you want to energize in the REMOTE or LOCAL position, as required. This places the switch in the ON position.

Wait approximately two seconds and verify that the selected loop is energized.

2.7.4 Switching from One Loop to Another Using Remote Control

To switch the output of an L-847 circuit selector switch from one series lighting loop to another using remote control, perform the following procedure:

See Figure 7. Place the switches corresponding to the series lighting loops to be controlled remotely in the REMOTE position.

Open the relay or switch contact externally connected to the terminal block TB1 from CR to either C1, C2, C3, or C4.

Wait approximately two seconds.

Close the appropriate relay or switch contact externally connected to the terminal block TB1 from CR to either C1, C2, C3, or C4.

2.7.5 Turning On/Off Lamp Status Indicator

See Figure 6 and Figure 7. When S1, S2, S3, or S4 is switched to REM, then the accessory (lamp or buzzer) connected to the REM terminal will be on. When S1, S2, S3, or S4 is switched to LOCAL, then the accessory connected to the LOCAL terminal will be on. When S1, S2, S3, or S4 is switched to OFF, then both accessories will be off. When the current flows in each loop, then the accessory connected to CS1, CS2, CS3, or CS4 terminals will be supplied with 120Vac.

NOTE: When the current is flowing through any loop, the current sensing contact will be closed to provide 120 Vac to turn on the accessory, that is, the lamp or buzzer. For example, when loop 1 is closed, the sensing control for loop 1 is closed. This 120 Vac provides a maximum of 1A only. For example, if four circuits are connected to four different accessories, the total must not exceed 1 A. Each of the four circuits would total no more than 0.25 A.

2.8 Maintenance

To keep the L-847 circuit selector switch operating efficiently, follow a preventive maintenance schedule. Refer to Table 9. Refer to FAA AC 150/5345-5A for more detailed information.

Table 9: L-847 Circuit Selector Switch Maintenance

| Interval | Maintenance Task | Action |
|---------------|---|----------------------|
| Semi-annually | Check for loose wire connections. | Tighten connections. |
| | Check for evidence of arcing around high voltage vacuum relay contacts. | Replace relay. |
| | Check for cracked or deteriorated wires. | Replace wires. |
| | Check for cracked high voltage porcelain insulators. | Replace insulator. |
| Annually | Check for excessive dirt build-up. | Clean panel. |
| | Check for paint rusting or flaking off. | Paint panel. |

2.9 Troubleshooting



CAUTION

- Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.
- De-energize the circuit and lock out the circuit or regulator so that the circuit cannot be energized by remote means before attempting to service the fixture.

This section contains troubleshooting information. This information covers only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local ADB Airfield Solutions representative for help.

Table 10:

| Problem | Possible Cause | Corrective Action |
|---|--|---|
| 1. Time delay PCB relays not activating | Blown fuse | Check and replace fuse F1, if necessary. |
| | No input voltage | Check terminal block TB1 terminals N and 120 for proper voltage (120VAC). |
| | Internal +24VDC power supply damaged | Check PS1 terminals +OUT and -OUT for proper voltage (24VDC). Replace if necessary. |
| 2. High voltage vacuum relays not operating | Defective high voltage vacuum relay | Replace, if necessary. |
| | Loose connections on low voltage wiring | Check all solder and screw connections. If necessary, resolder and tighten wiring connections. |
| | Internal +24VDC power supply damaged | Check PS1 terminals +OUT and -OUT for proper voltage (24VDC). Replace if necessary. |
| | Defective time delay PCB | Replace, if necessary. |
| 3. L-847 not working in remote control | Defective remote control switches | Replace, as necessary. |
| | No control voltage | Check terminal block TB1 terminals N and C1 through C4 for proper 120VAC control voltage. If 120VAC exists, check and replace wiring. If 120VAC does not exist, replace fuse. |
| 4. No current sensing signal even though current flowing in loop | Damaged current sensing relay | Replace current sensing relay. |
| 5. CCR not turning off when loop is open (this applies to interlock switch option only) | Incorrect wiring of CCR remote CCI wiring to L-847 | Correct wiring error from CCR remote CCI wire to L-847. See Figure 5. |
| | Damaged interlock switch | Replace interlock switch. |

3.0 Wiring Schematics and Mechanical Drawings

Figure 1:

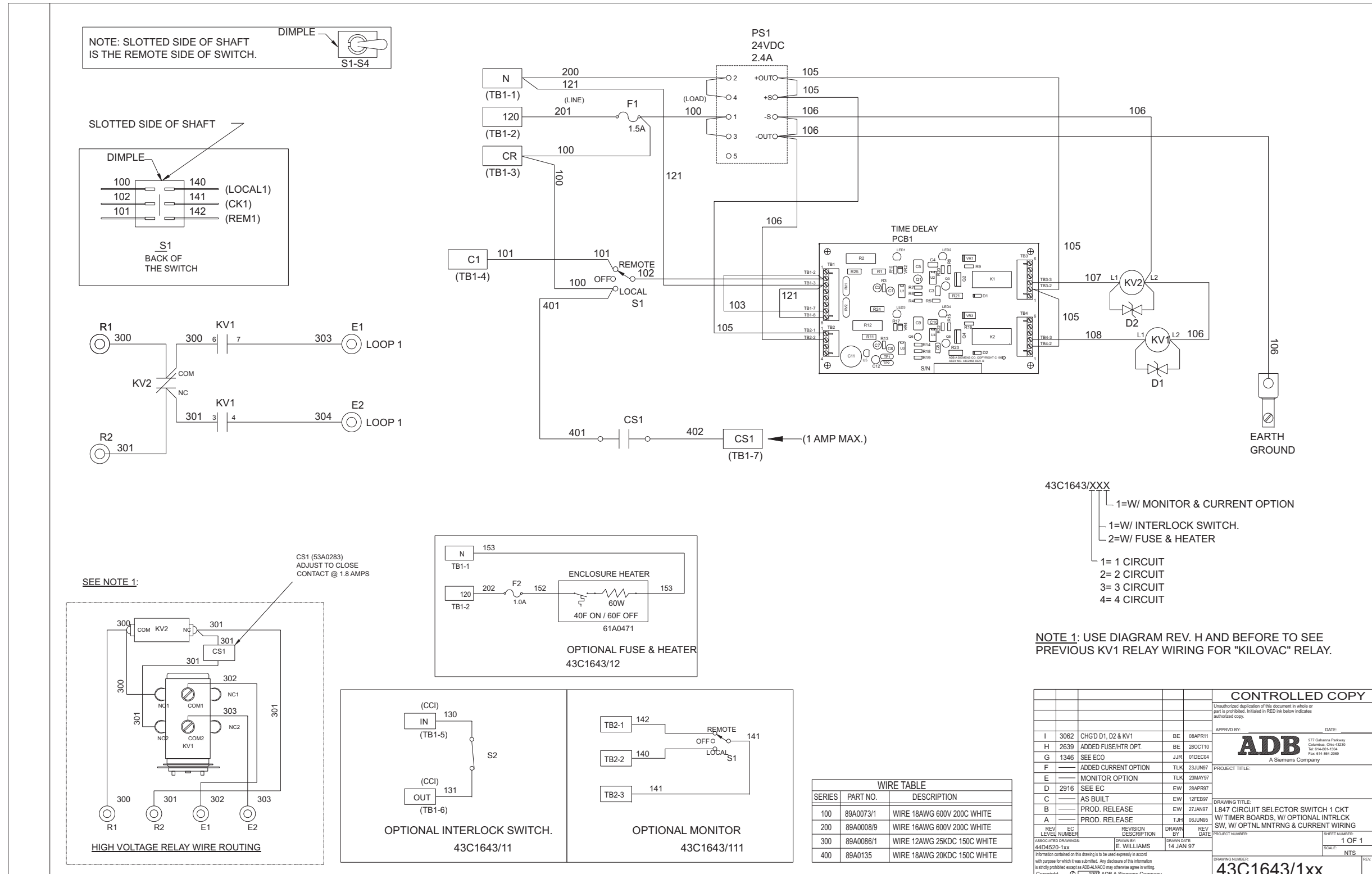
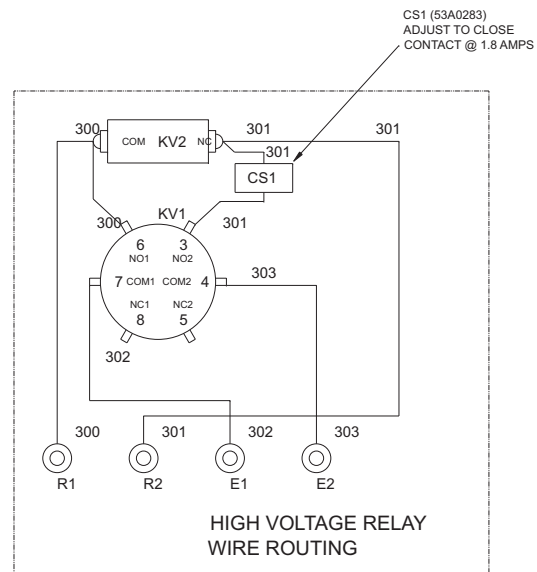


Figure 2:



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| I | 3062 | CHGD D1, D2 & KV1 | BE 08APR11 |
| H | 2639 | ADDED FUSE/HTR OPT. | BE 28OCT10 |
| G | 1346 | SEE ECO | JJR 01DEC04 |
| F | | ADDED CURRENT OPTION | TLK 23JUN97 |
| E | | MONITOR OPTION | TLK 23MAY97 |
| D | 2916 | SEE EC | EW 28APR97 |
| C | | AS BUILT | EW 12FEB97 |
| B | | PROD. RELEASE | EW 27JAN97 |
| A | | PROD. RELEASE | TJH 06JUN95 |
| REV | EC | REVISION DESCRIPTION | DRAWN BY DATE |
| LEVEL | NUMBER | | REV DATE |
| 44D452D-1xx | | E. WILLIAMS | 14 JAN 97 |
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Figure 3:

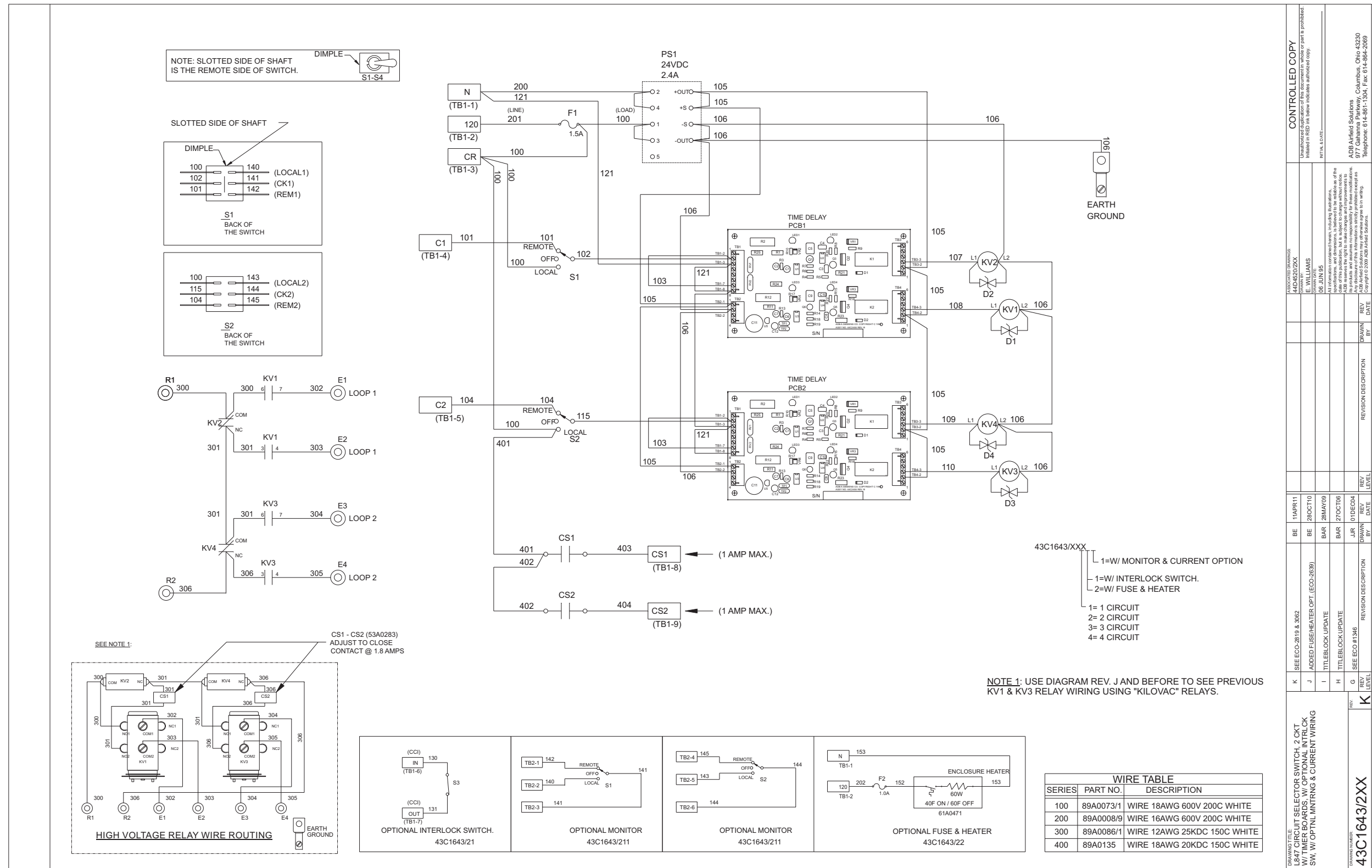


Figure 5:

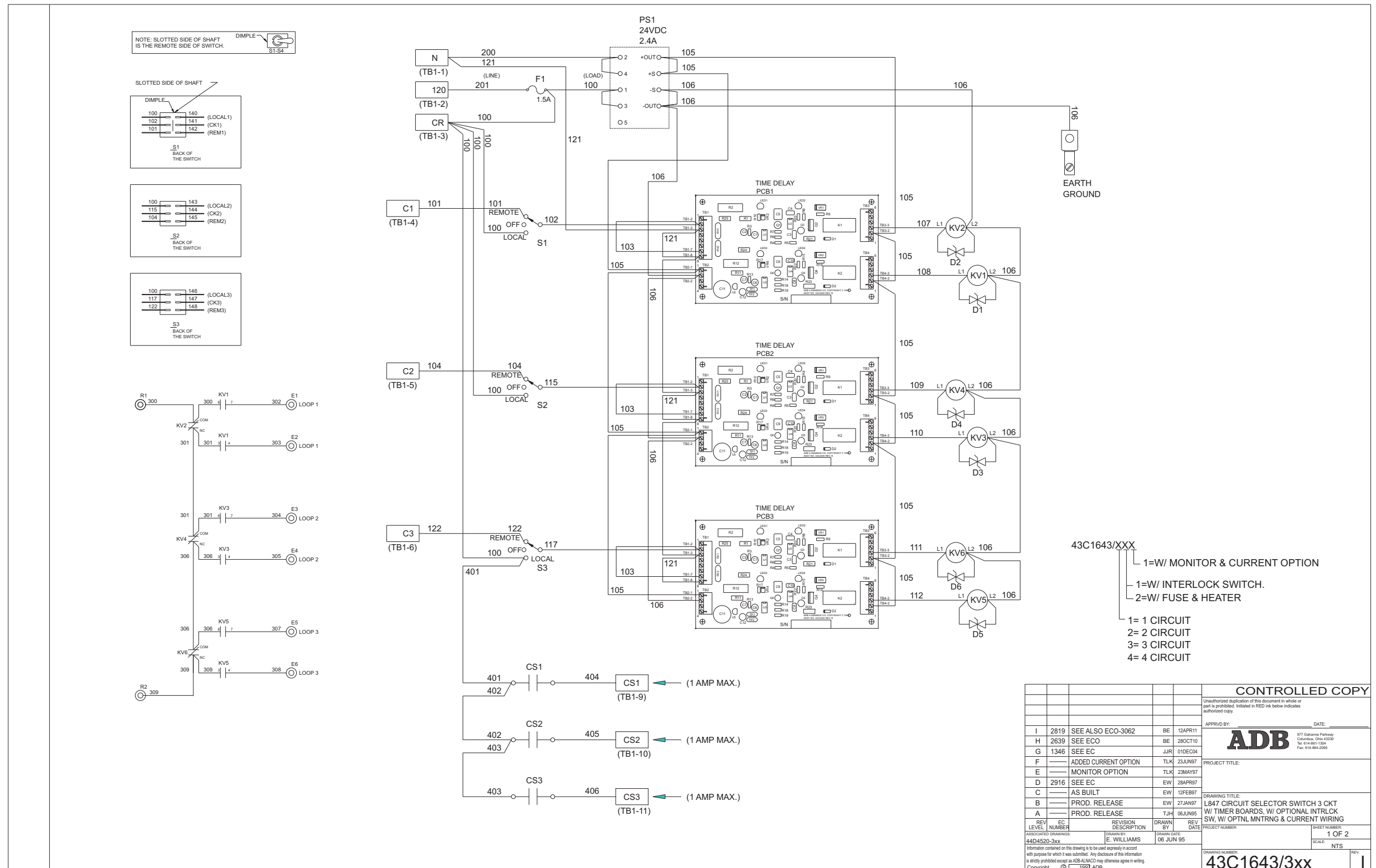
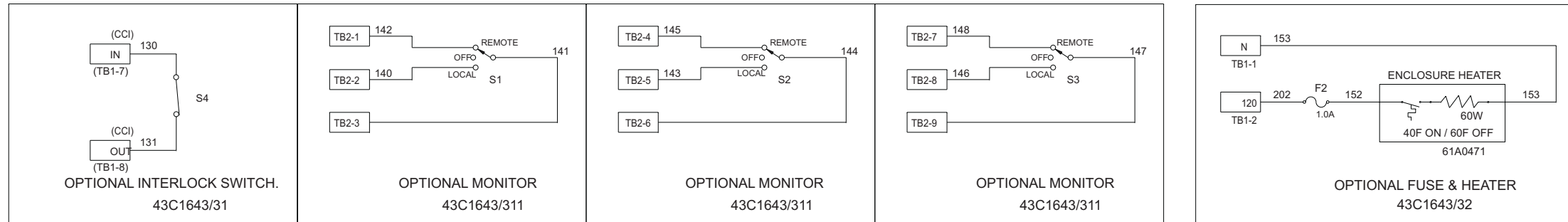
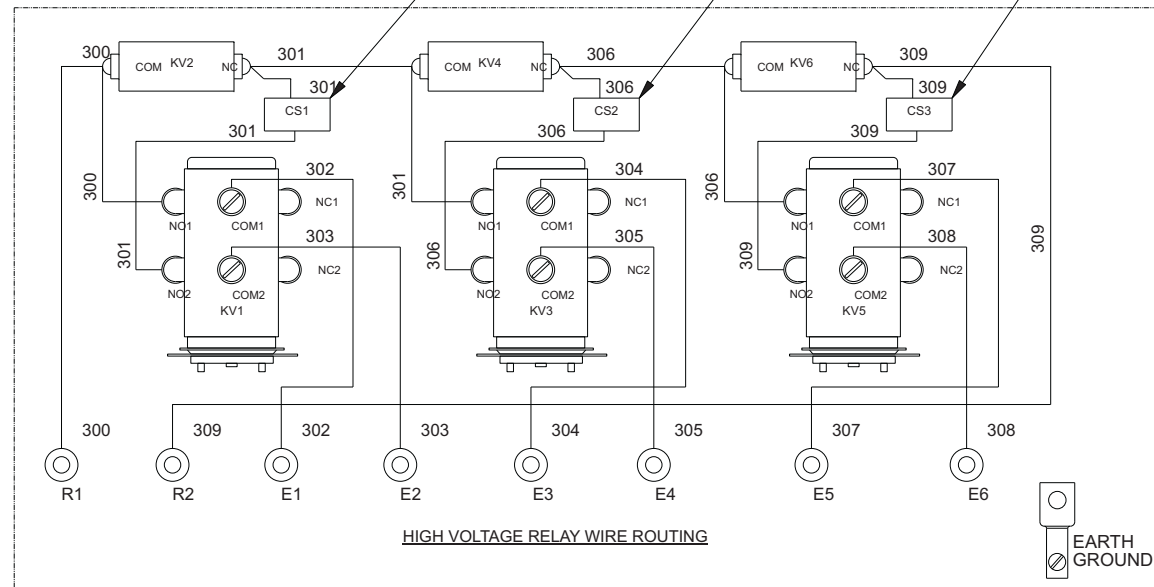


Figure 6:



| WIRE TABLE | | |
|------------|-----------|-----------------------------|
| SERIES | PART NO. | DESCRIPTION |
| 100 | 89A0073/1 | WIRE 18AWG 600V 200C WHITE |
| 200 | 89A0008/9 | WIRE 16AWG 600V 200C WHITE |
| 300 | 89A0086/1 | WIRE 12AWG 25KDC 150C WHITE |
| 400 | 89A0135 | WIRE 18AWG 20KDC 150C WHITE |

SEE NOTE 1:



CS1 - CS3 (53A0283)
ADJUST TO CLOSE
CONTACT @ 1.8 AMPS

- 43C1643/XXX
- 1=W/ MONITOR & CURRENT OPTION
 - 1=W/ INTERLOCK SWITCH.
 - 2=W/ FUSE & HEATER
- 1= 1 CIRCUIT
2= 2 CIRCUIT
3= 3 CIRCUIT
4= 4 CIRCUIT

NOTE 1: USE DIAGRAM REV. H AND BEFORE TO SEE PREVIOUS KV1, KV3, AND KV5 RELAY WIRING USING "KILOVAC" RELAYS.

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| G | 1346 | SEE EC | JJR | 01DEC04 | |
| F | | ADDED CURRENT OPTION | TLK | 23JUN97 | PROJECT TITLE: |
| E | | MONITOR OPTION | TLK | 23MAY97 | |
| D | 2916 | SEE EC | EW | 28APR97 | |
| C | | AS BUILT | EW | 12FEB97 | |
| B | | PROD. RELEASE | EW | 27JAN97 | DRAWING TITLE: |
| A | | PROD. RELEASE | TJH | 06JUN95 | L847 CIRCUIT SELECTOR SWITCH 3 CKT W/ TIMER BOARDS, W/ OPTIONAL INTRLCK SW, W/ OPTNL MNTNRG & CURRENT WIRING |
| REV | EC | REVISION DESCRIPTION | DRAWN BY | REV DATE | PROJECT NUMBER: |
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Figure 7:

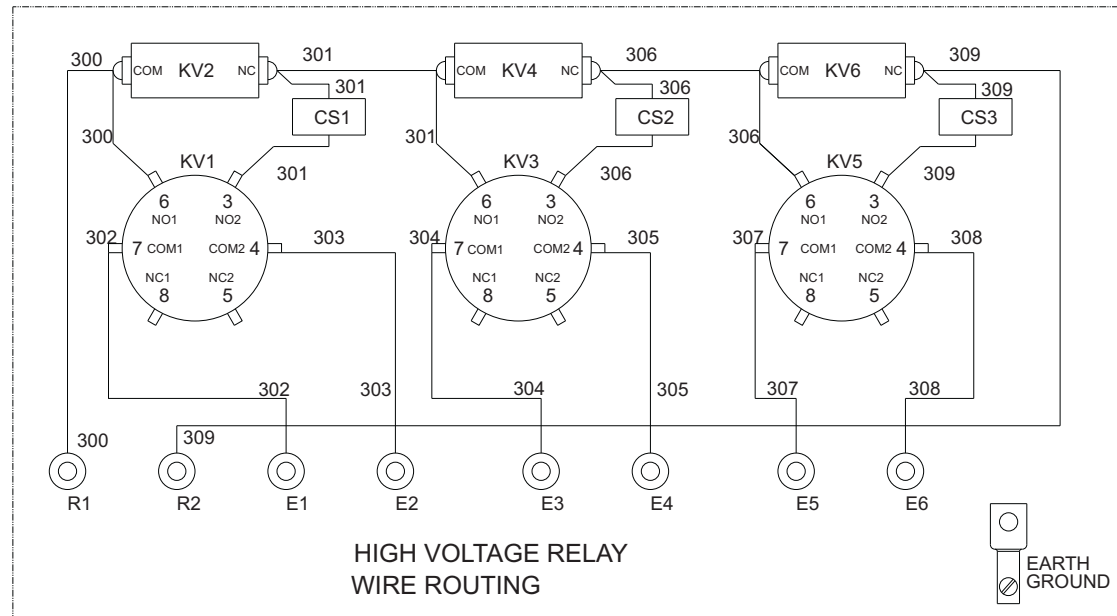


Figure 8:

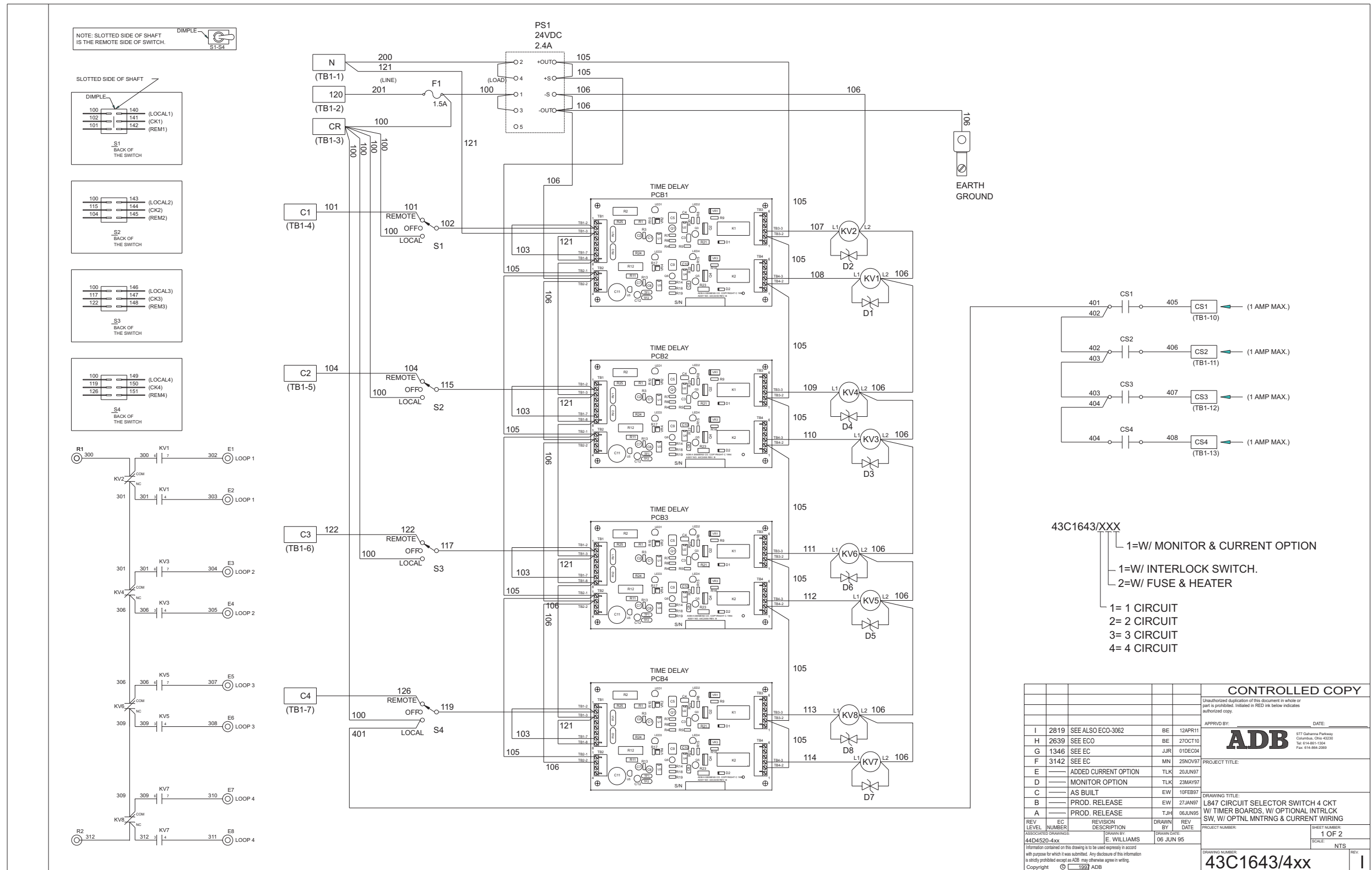


Figure 9:

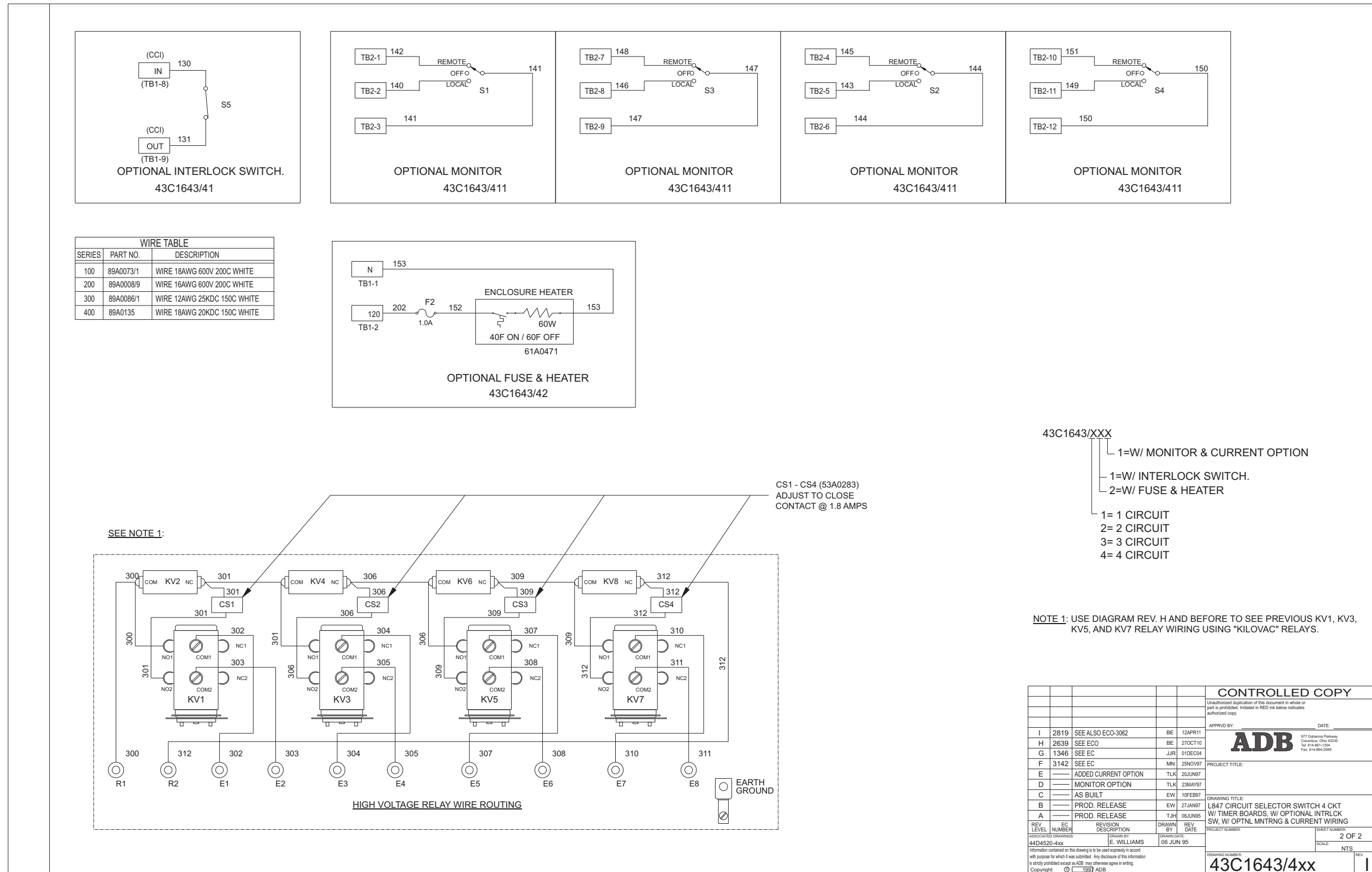


Figure 10:

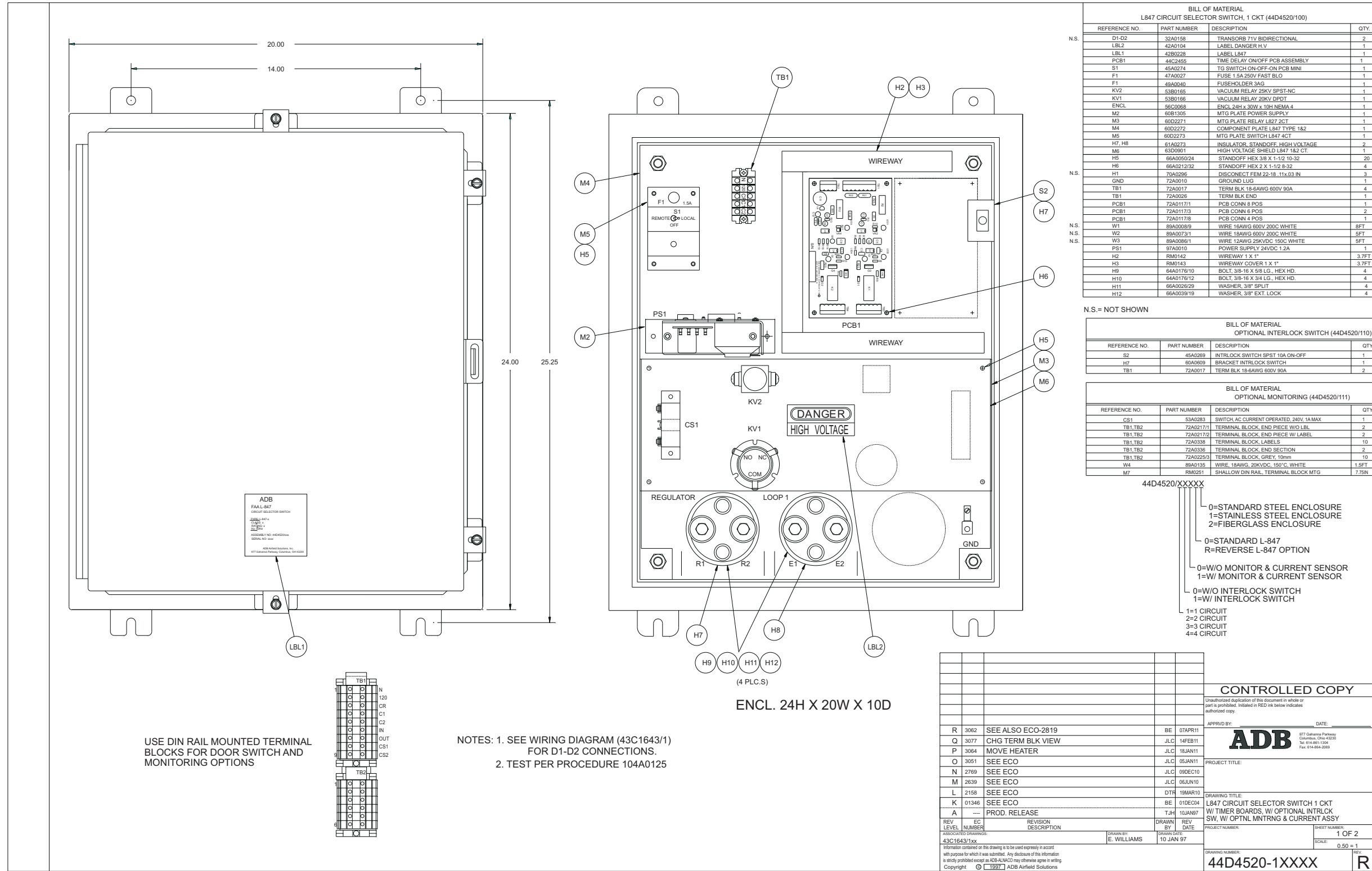


Figure 11:

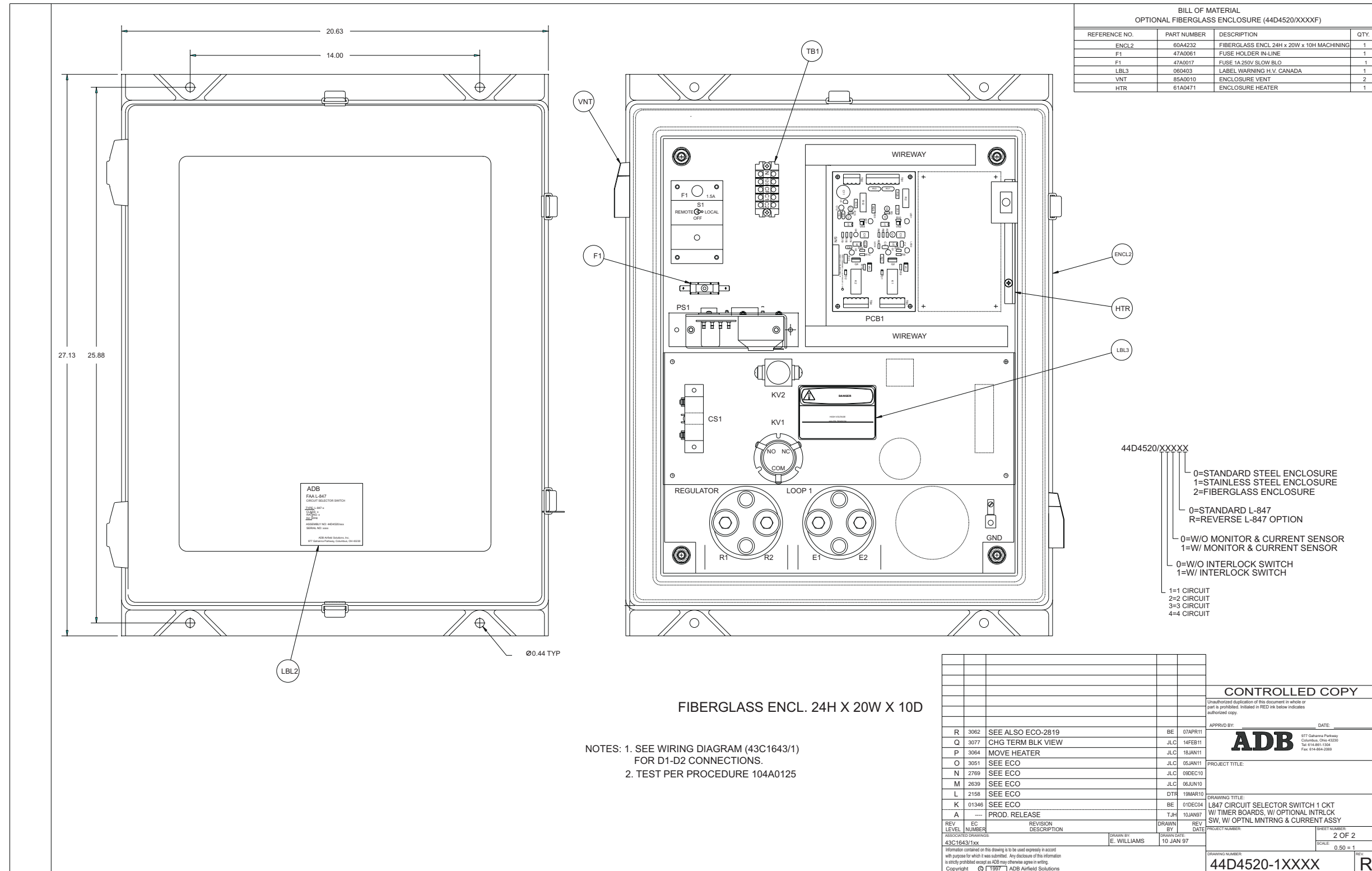


Figure 13:

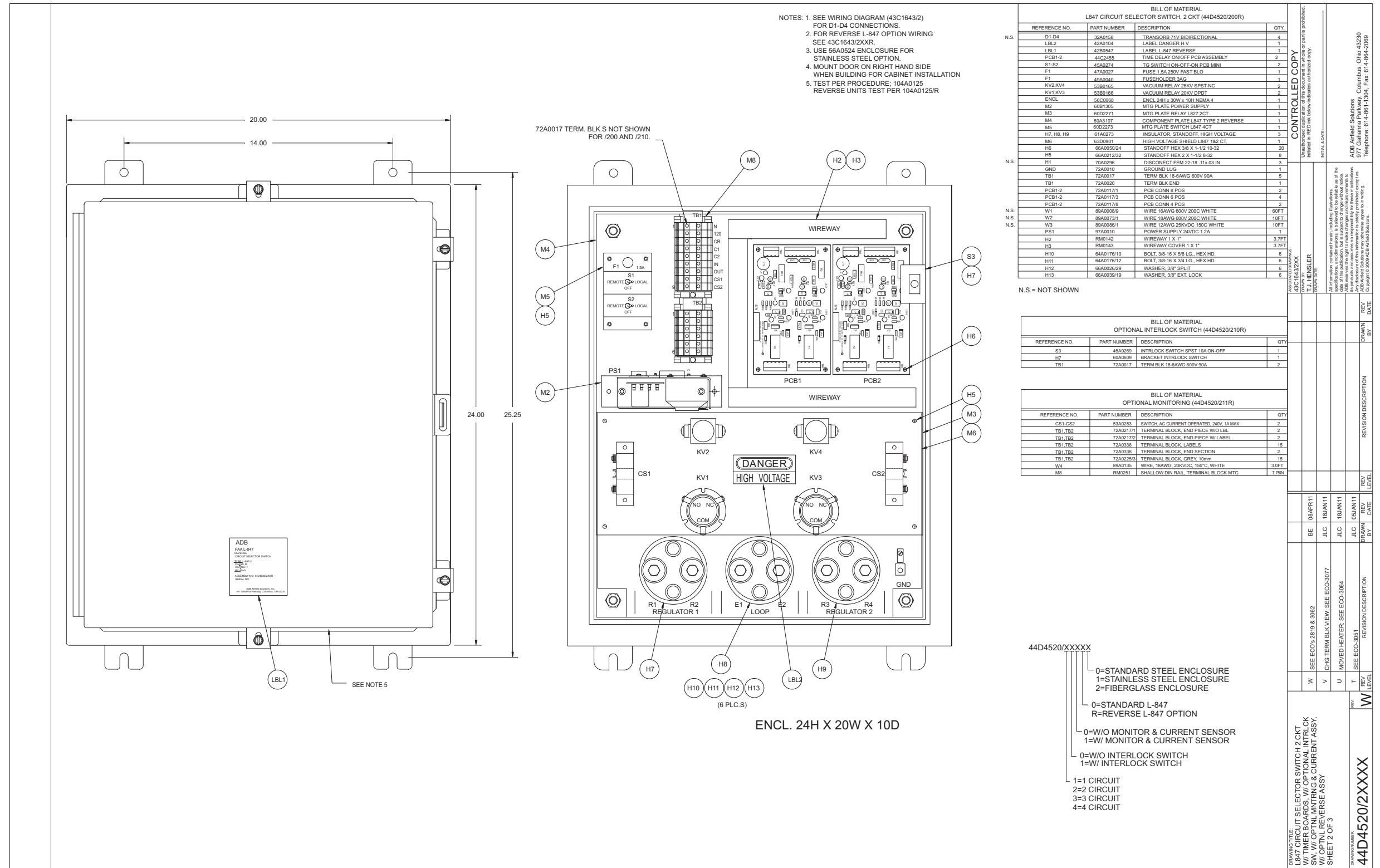


Figure 14:

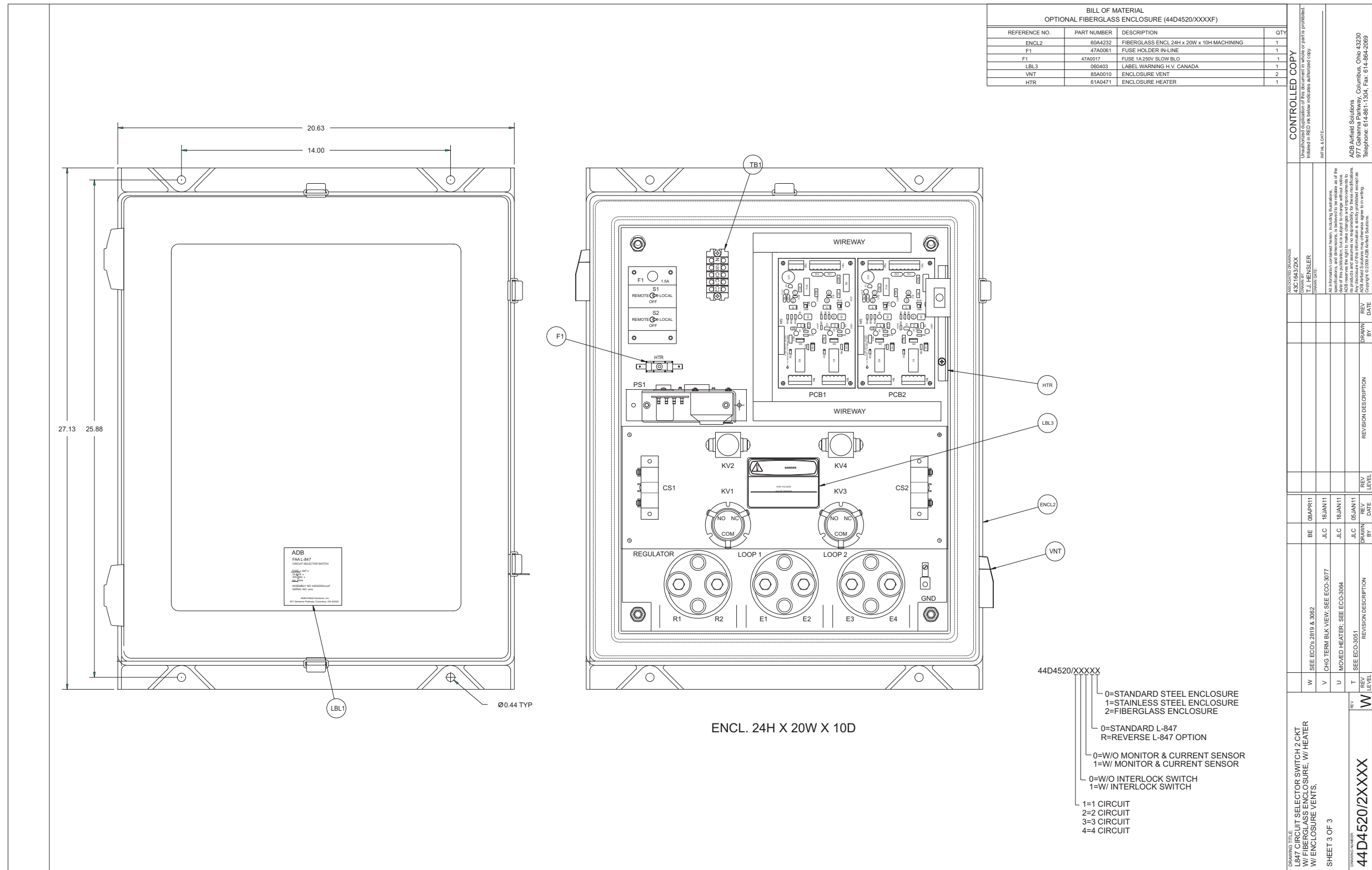


Figure 15:

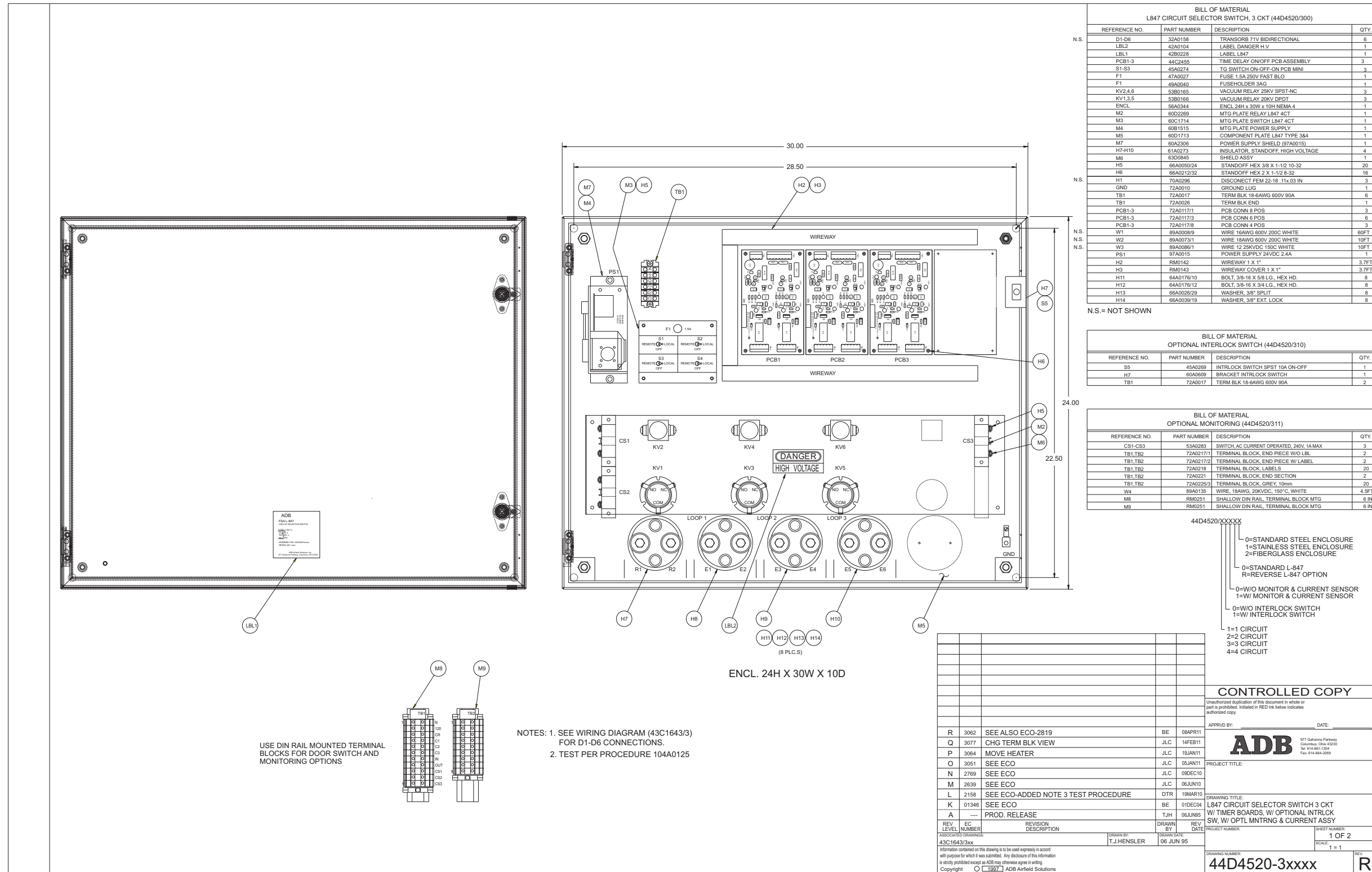


Figure 16:

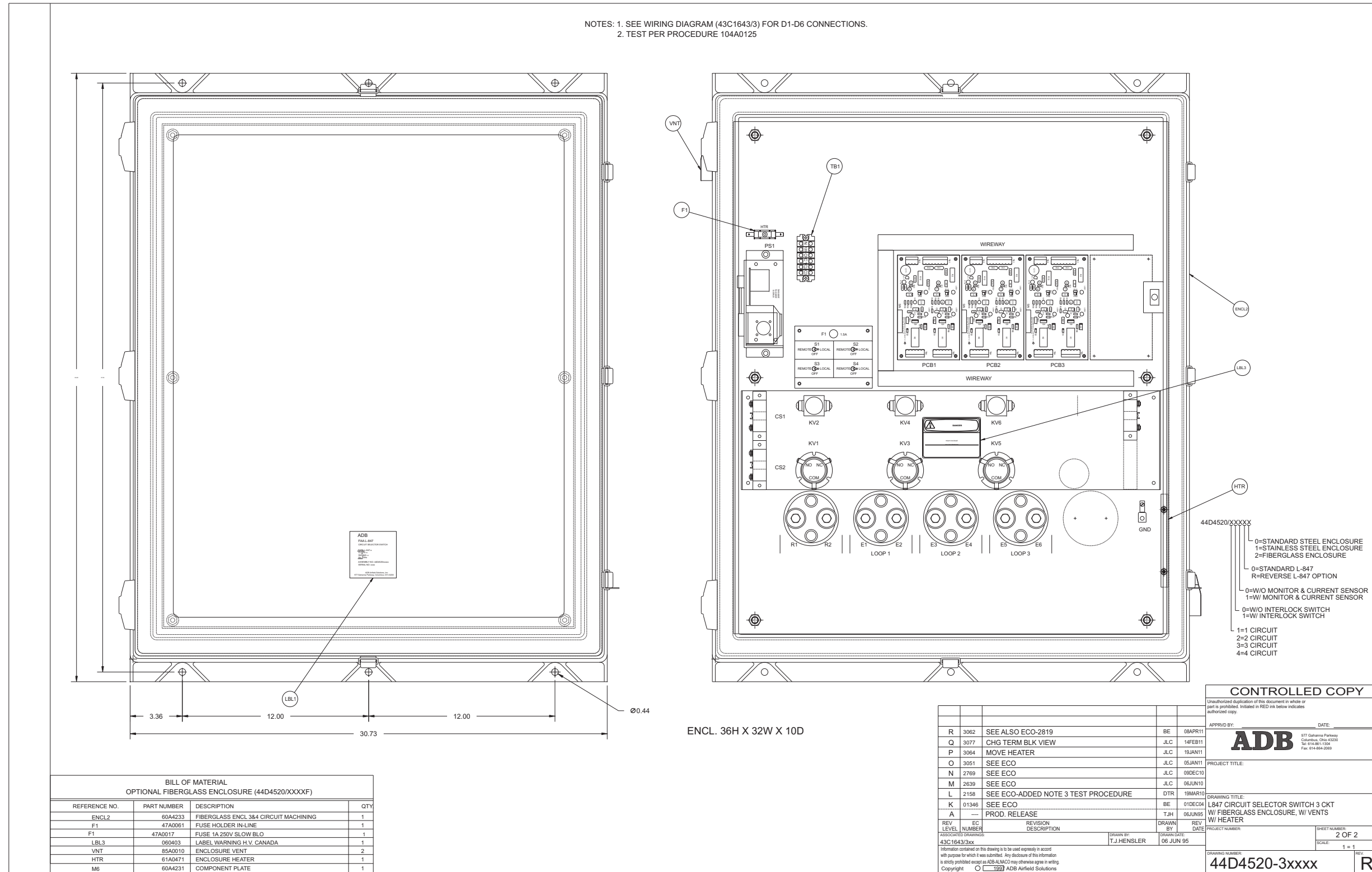


Figure 17:

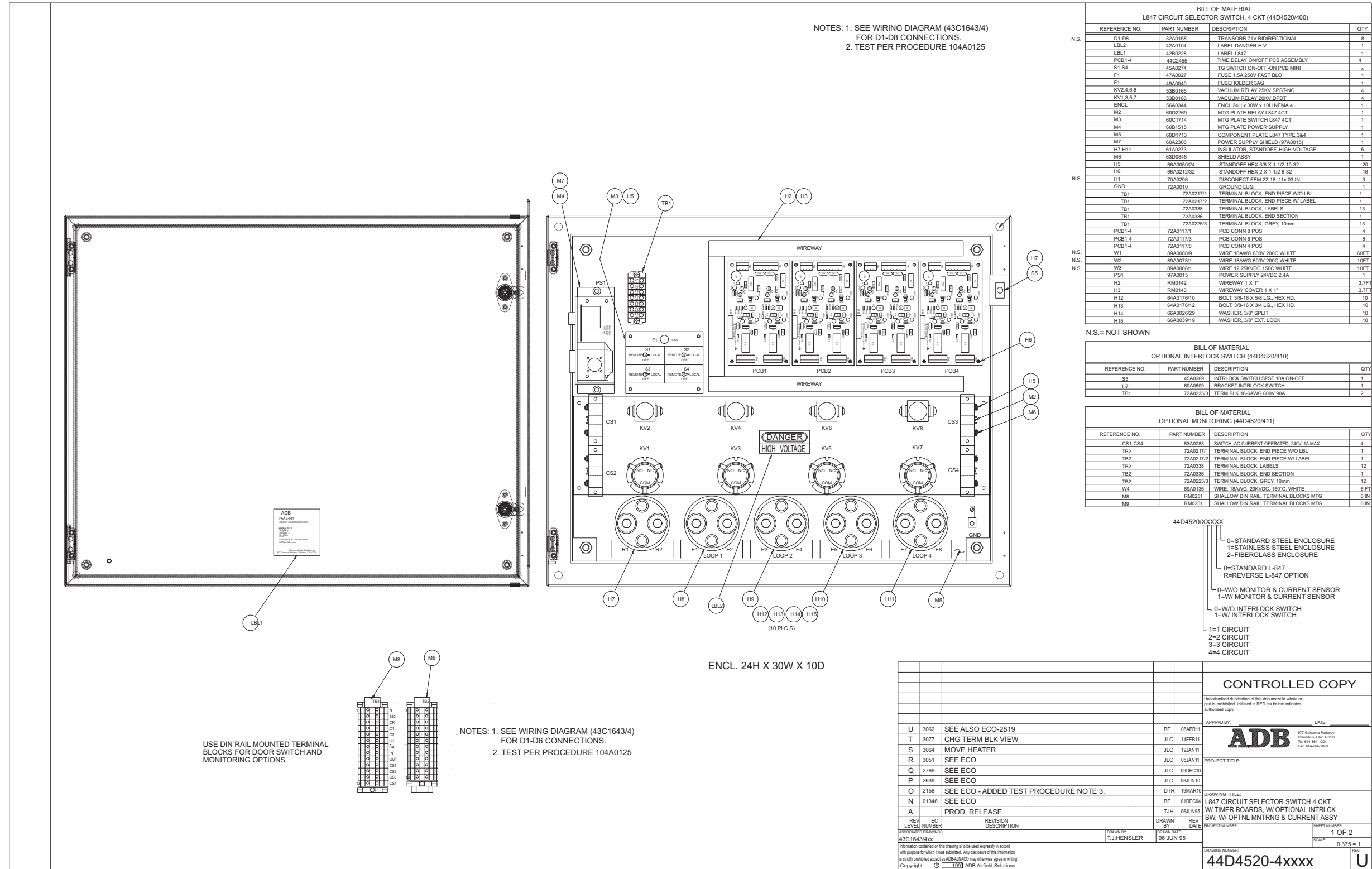
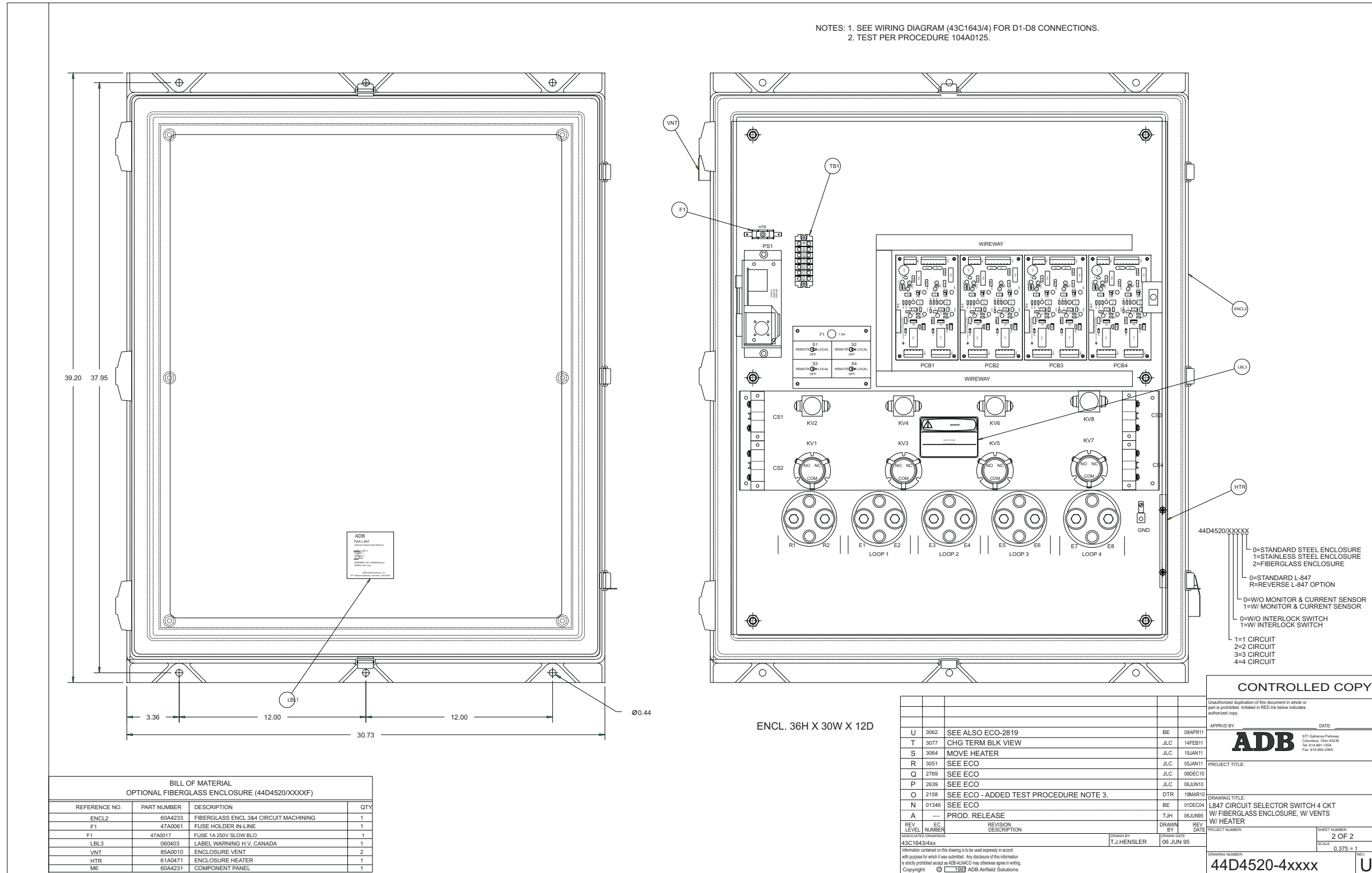


Figure 18:



BILL OF MATERIAL
OPTIONAL FIBERGLASS ENCLOSURE (44D4520/XXXXF)

| REFERENCE NO. | PART NUMBER | DESCRIPTION | QTY |
|---------------|-------------|---------------------------------------|-----|
| ENCL2 | 60A4233 | FIBERGLASS ENCL 364 CIRCUIT MACHINING | 1 |
| F1 | 47A0061 | FUSE HOLDER IN-LINE | 1 |
| F1 | 47A0017 | FUSE 1A 250V SLOW BLO | 1 |
| LBL3 | 060403 | LABEL WARNING H.V. CANADA | 1 |
| VNT | 85A0010 | ENCLOSURE VENT | 2 |
| HTR | 81A0471 | ENCLOSURE HEATER | 1 |
| M6 | 60A4231 | COMPONENT PANEL | 1 |

**L-847 Circuit Selector Switch
Operation Manual**

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