



L-847 Circuit Selector Switch

User Manual

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**ADB
SAFEGATE**

A.0 Disclaimer / Standard Warranty

CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

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Note

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ADB SAFEGATE L858(L) Airfield Guidance Signs are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition).

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Note

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Unintended uses, includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB SAFEGATE replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB SAFEGATE equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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TABLE OF CONTENTS

1.0 Safety	1
1.1 Safety Messages	1
1.1.1 Introduction to Safety	2
1.1.2 Intended Use	2
1.1.3 Material Handling Precautions: Storage	3
1.1.4 Operation Safety	3
1.1.5 Maintenance Safety	3
1.1.6 Material Handling Precautions, ESD	4
1.1.7 Arc Flash and Electric Shock Hazard	4
2.0 Circuit Selector Switch	5
2.1 About this manual	5
2.1.1 How to work with the manual	5
2.2 System Overview	5
2.3 Circuit Selector Switch	6
3.0 Theory of Operation	7
3.1 General	7
3.2 External Connectors and Local Control	8
3.3 High Voltage Relay Switching	8
3.3.1 Loop Energizing Steps	8
3.3.2 Loop De-energizing Steps	8
3.4 Interlock Switch (Optional)	8
3.5 Monitor (Optional)	9
3.6 Reverse L-847 (Optional)	9
3.7 L-847 Circuit Selector Switch: Required Equipment	9
4.0 Installation	11
4.1 Unpacking	11
4.2 Mounting	11
4.3 Mounting Dimension Diagrams	12
4.4 Wiring	12
4.4.1 Installing Interlock Switch (Optional)	13
4.4.2 Installing Monitor (Optional)	14
5.0 Operation	17
5.1 Energizing Series of Lighting Loops Using Local Control	18
5.2 Energizing Series of Lighting Loops Using Remote Control	18
5.3 Switching from One Loop to Another Using Local Control	18
5.4 Switching from One Loop to Another Using Remote Control	18
5.5 Turning On/Off Lamp Status Indicator	18
6.0 Maintenance	21
6.1 Preventative Maintenance	21
6.2 Troubleshooting	21
6.3 Circuit Selector Wiring Diagrams	22
7.0 Parts	39
7.1 Parts Diagrams	40
7.2 Spare Parts	42
A.0 SUPPORT	43
A.1 ADB SAFEGATE Website	43
A.2 Recycling	44
A.2.1 Local Authority Recycling	44
A.2.2 ADB SAFEGATE Recycling	44

1.0 Safety

Introduction to Safety

This section contains general safety instructions for installing and using ADB SAFEGATE 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 Safety Messages

HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

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



WARNING

Failure to observe a warning may result in personal injury, death or equipment damage.



DANGER - Risk of electrical shock or ARC FLASH

Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.



WARNING - Wear personal protective equipment

Failure to observe may result in serious injury.



WARNING - Do not touch

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



CAUTION

Failure to observe a caution may result in equipment damage.

Qualified Personnel



Important Information

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 practice.

1.1.1 Introduction to Safety



CAUTION

Unsafe Equipment Use

This equipment may contain electrostatic devices, hazardous voltages and sharp edges on components

- Read installation instructions in their entirety before starting installation.
- 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 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.

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

Additional Reference Materials



Important Information

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies.
- IEC 60364 - Electrical Installations in Buildings.
- FAA Advisory: AC 150/5340-26 (current edition), Maintenance of Airport Visual Aid Facilities.
- Maintenance personnel must refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

1.1.2 Intended Use



CAUTION

Use this equipment as intended by the manufacturer

This equipment is designed to perform a specific function, do not use this equipment for other purposes

- 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.

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

1.1.3 Material Handling Precautions: Storage



CAUTION

Improper Storage

Store this equipment properly

- 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 equipment damage

1.1.4 Operation Safety



CAUTION

Improper Operation

Do Not Operate this equipment other than as specified by the manufacturer

- 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.

Failure to follow these instructions can result in equipment damage

1.1.5 Maintenance Safety



DANGER

Electric Shock Hazard

This equipment may contain electrostatic devices

- 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.

Failure to follow these instructions can result in death or equipment damage

1.1.6 Material Handling Precautions, ESD



CAUTION

Electrostatic Sensitive Devices

This equipment may contain electrostatic 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 shall 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.

Failure to follow this instruction can result in equipment damage

1.1.7 Arc Flash and Electric Shock Hazard



DANGER

Series Circuits have Hazardous Voltages

This equipment produces high voltages to maintain the specified current - Do NOT Disconnect while energized.

- Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.
- Only persons who are properly trained and familiar with ADB SAFEGATE equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating; Arc flash may result.
- 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 SAFEGATE replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the 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 airfield electrical equipment.

Failure to follow these instructions can result in death or equipment damage

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.

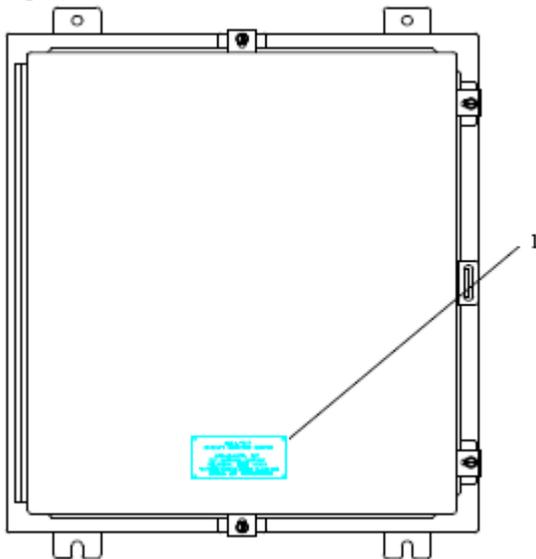
2.1.1 How to work with the manual

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

2.2 System Overview

This section describes the ADB Safegate 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)



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

2.3 Circuit Selector Switch

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

Uses

FAA L-847 ICAO To switch the output of a constant current regulator (CCR) to one or more series lighting loops.

Reversed L-847

A special “reversed” L-847 is also available. This L-847 allows a single load to be individually powered from multiple CCRs.

A typical application would be to have a primary and a backup CCR connected to a single load. In case of primary CCR failure, the L-847 allows a backup CCR to be quickly manually switched into the circuit. Contact the ADB SAFEGATE Sales Department for details.

Input Power Requirements

Type	Average Volt Amp (VA)
L-847-1	40
L-847-2	65
L-847-3	85
L-847-4	110

Electrical

Input voltage:	120 VAC, ±10%, 50/60 Hz
Control voltage:	120 VAC, ±10%, 50/60 Hz
Output rating:	5,000 VAC at 6.6 A or 20 A

3.0 Theory of Operation

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.

3.1 General

See Figure 4. 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.

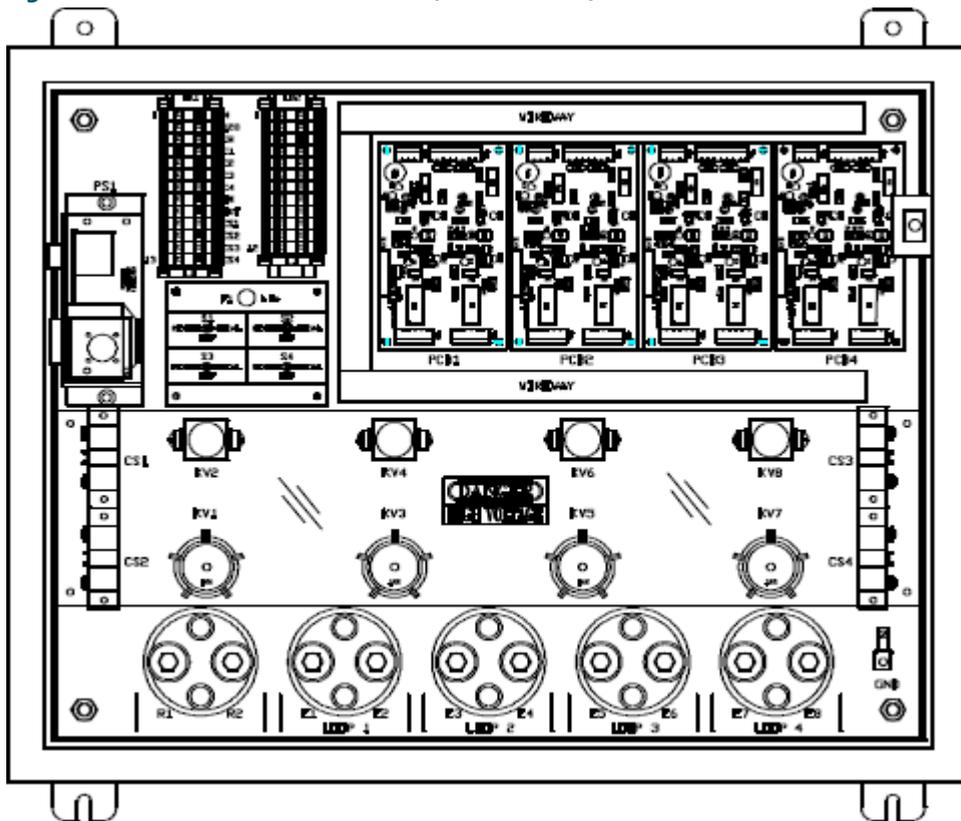
See Internal Wiring in the Wiring Schematic section for internal wiring connections for all four FAA types of circuit selector switches and for the L-847 Reverse type of circuit selector switch.



Note

In Figure 4, the four-circuit selector switch is used to show representative parts for all four types of selector switches.

Figure 4: Four-Circuit Selector Switch (Internal View)



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

3.2 External Connectors and Local Control

See [Figure 4](#) and [Circuit Selector Wiring Diagrams](#). 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.

3.3 High Voltage Relay Switching

3.3.1 Loop Energizing Steps

See [Figure 4](#). 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, its “on” relay energizes. This applies +24VDC to the coil of high voltage vacuum relay KV2.

KV2 energizes, opening its 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

3.3.2 Loop De-energizing Steps

See [Figure 4](#). 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, its “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.

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.

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
- 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.

3.6 Reverse L-847 (Optional)

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.

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

4.0 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.

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

4.1 Unpacking

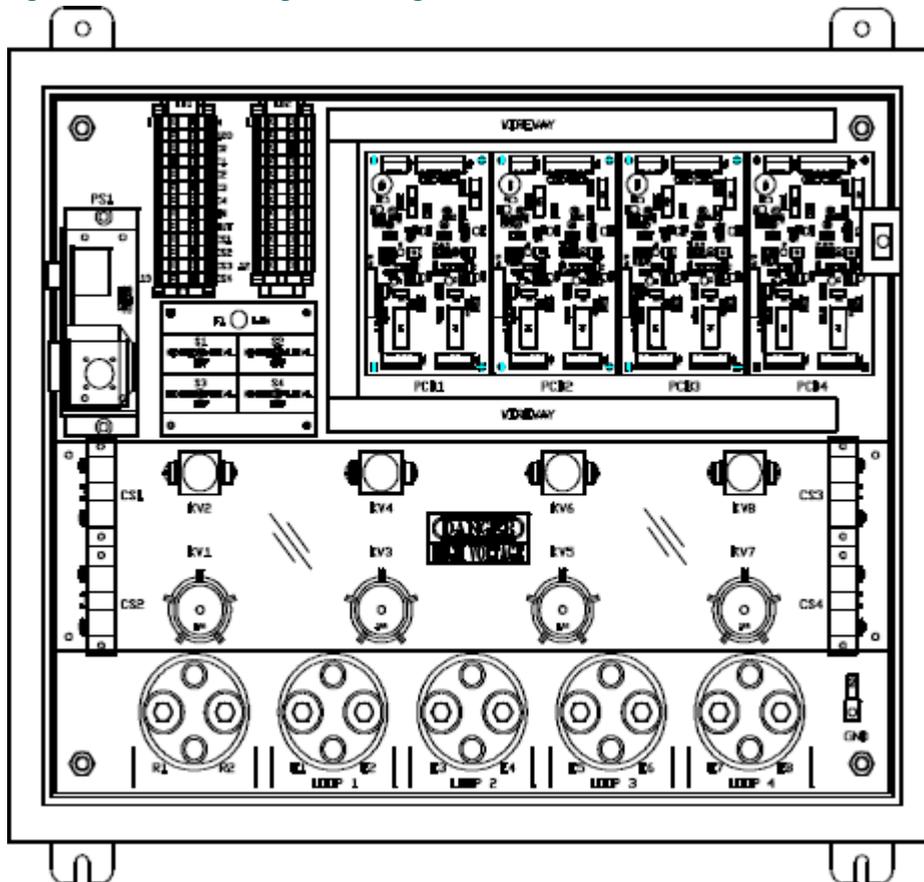
Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

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

4.2 Mounting

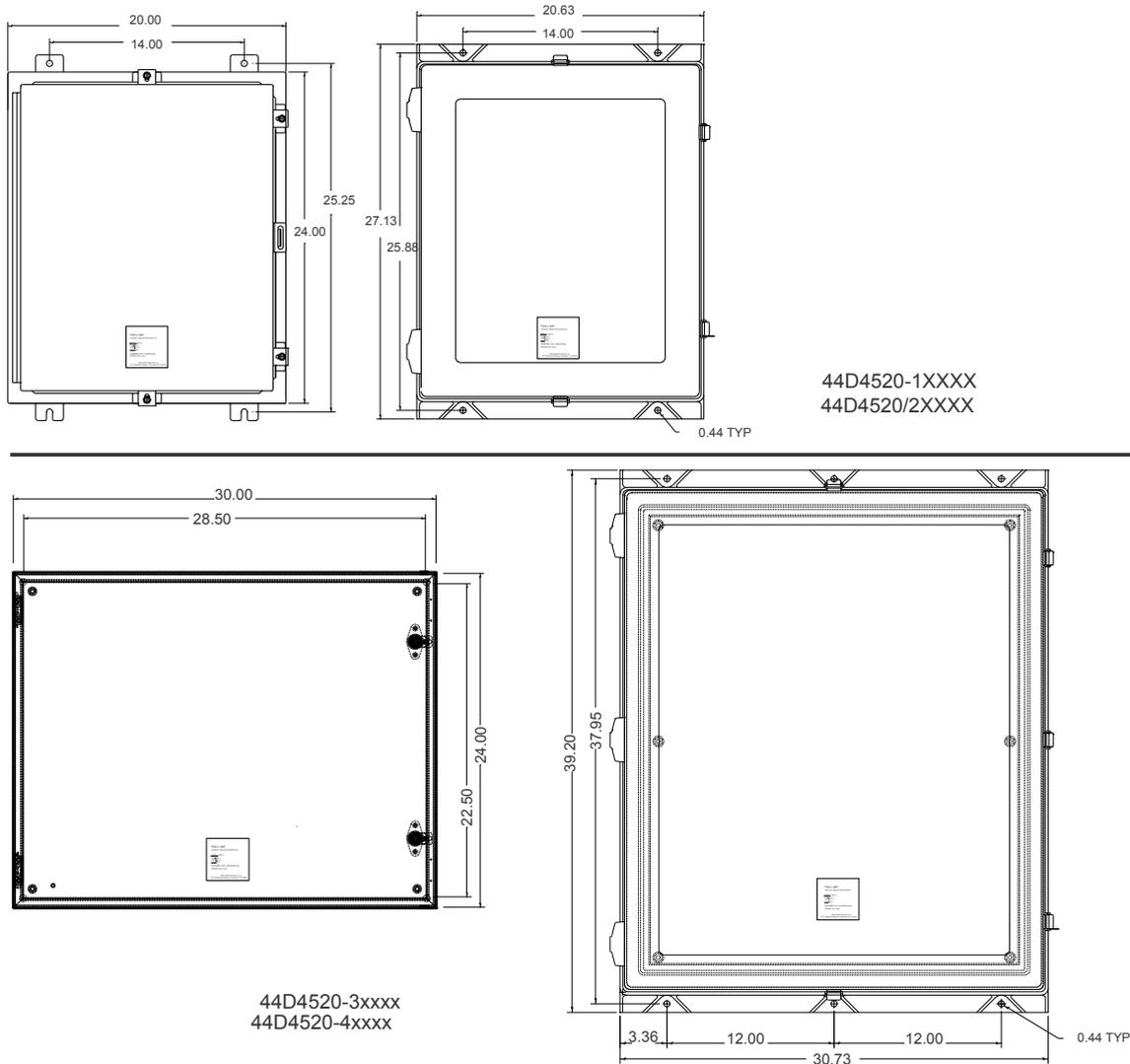
See [Figure 5](#). The enclosure has four mounting tabs, two located at the top and two at the bottom. Mount the control panel on fabricated mounting legs or wall-mount with appropriate hardware for the surface to which the panel is mounted. The panel enclosure is a NEMA 4 type and can be used indoors or outdoors. Refer to project plans and specifications for appropriate mounting details.

Figure 5: L-847 Mounting and Wiring



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

4.3 Mounting Dimension Diagrams



4.4 Wiring



WARNING

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

Refer to [Circuit Selector Wiring Diagrams](#) on page 25 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 4](#). 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.

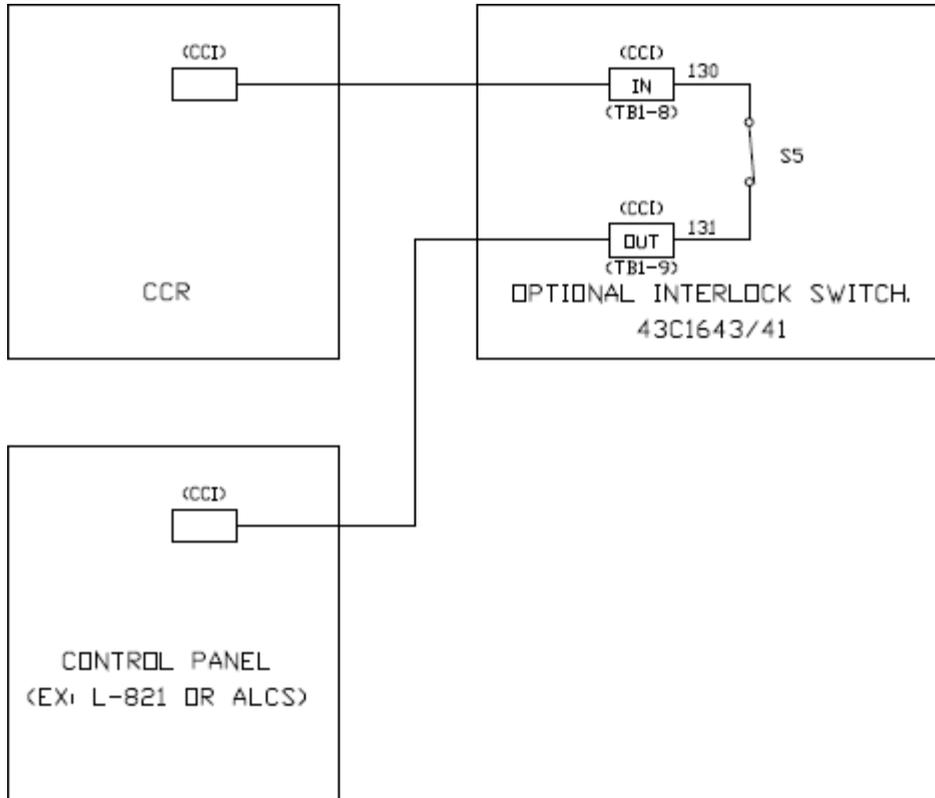
4.4.1 Installing Interlock Switch (Optional)

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

See [Figure 6](#).

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

Figure 6: Installing Interlock Switch



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

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

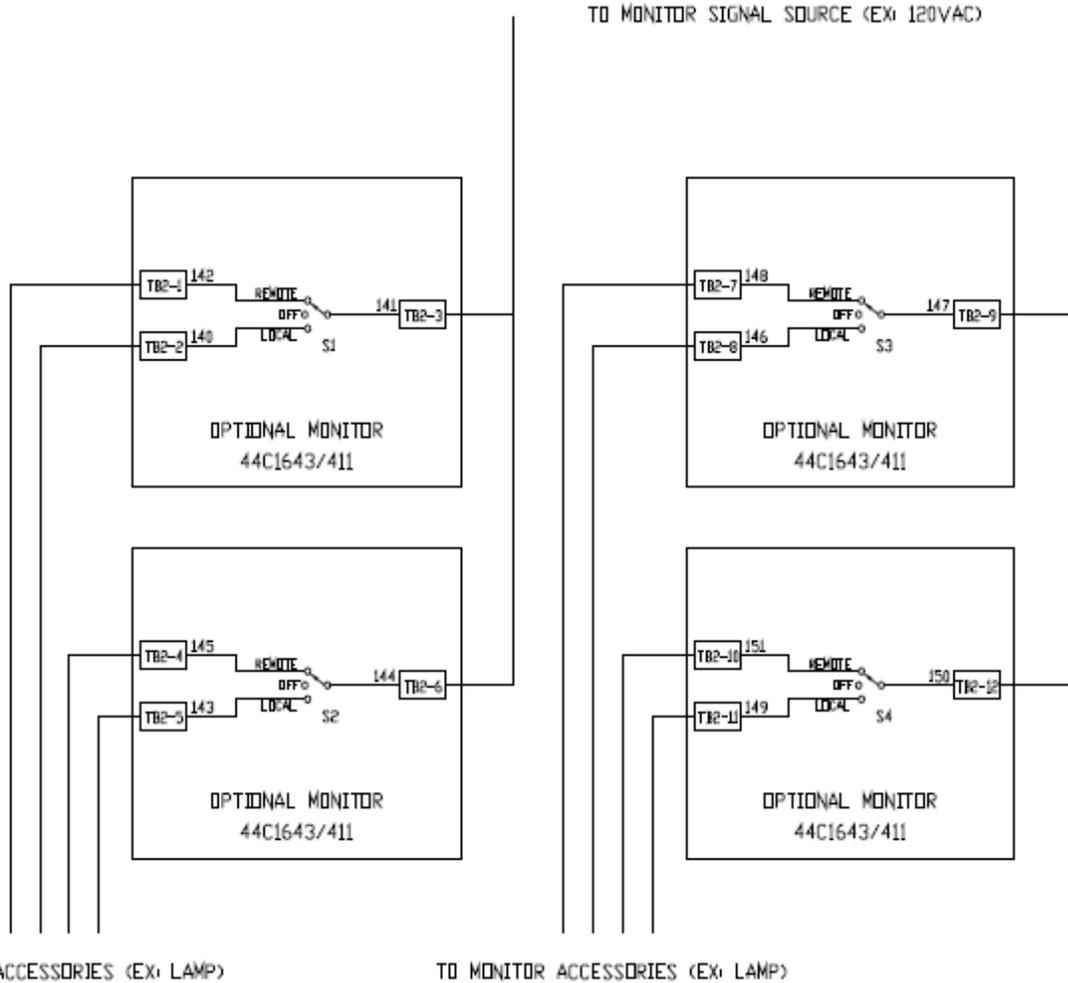
4.4.2 Installing Monitor (Optional)

To install the optional monitoring, perform the following procedure:

Remote/Local Feedback Monitoring

See Figure 7. 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 7: Installing Monitoring Remote/Local Feedback



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

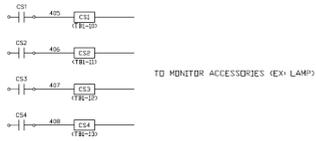
Loop	Connection
Loop 2	SIGNAL to TB2-6 REM to TB2-4 LOCAL to TB2-5
Loop 3	SIGNAL to TB2-9 REM to TB2-7 LOCAL to TB2-8
Loop 4	SIGNAL to TB2-12 REM to TB2-10 LOCAL to TB2-11

4.4.2.1 Energized field circuit feedback

See [Figure 8](#). 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 8: Accessory Wire Connections



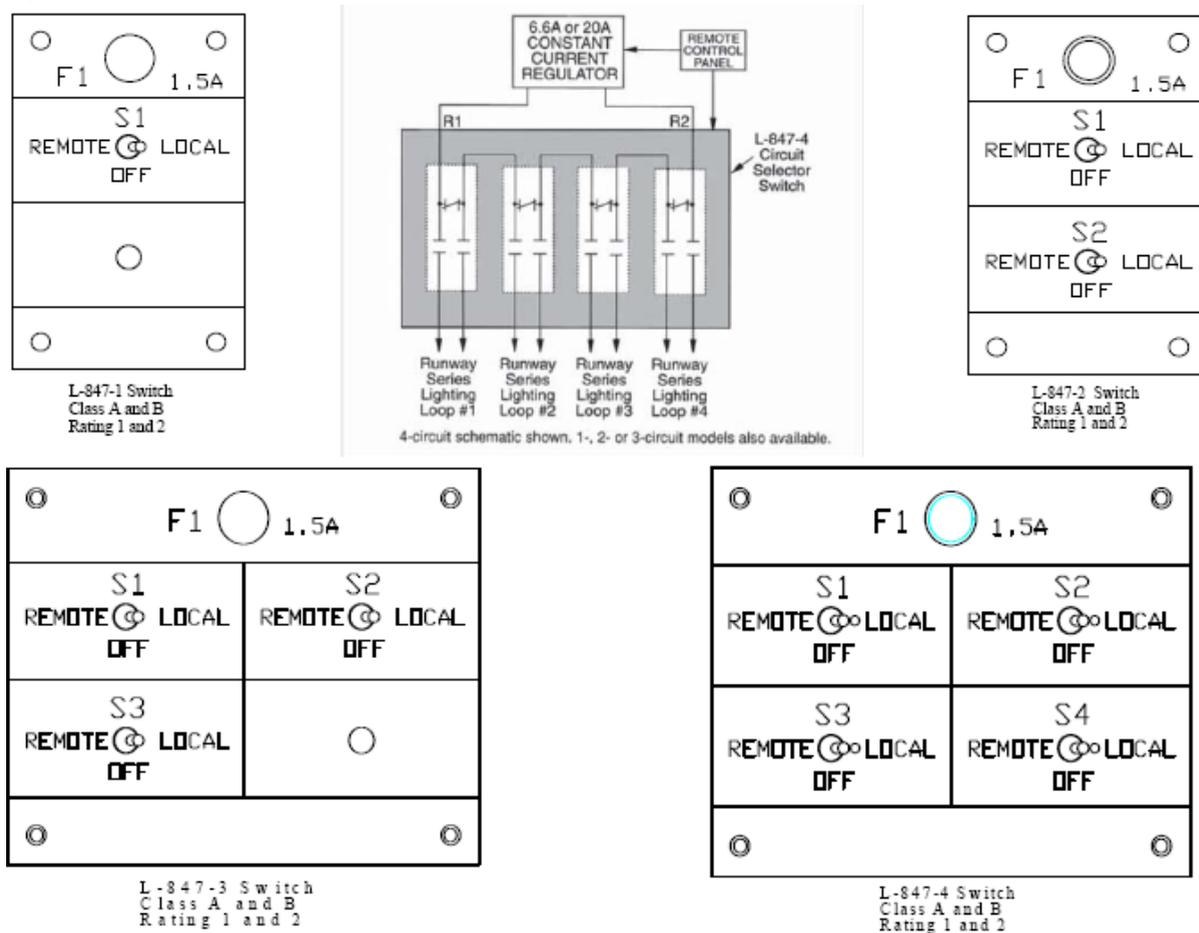
5.0 Operation

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 9](#) for the remote and local switches and protective fuses for all four types of L-847s.

Figure 9: Control Switches



Refer to [Table 6](#) for definitions of control switch functions.

Table 6: 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

5.1 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 9](#).

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.

5.2 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 9](#). 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.

5.3 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 9](#).

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.

5.4 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 9](#). 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.

5.5 Turning On/Off Lamp Status Indicator

See [Figure 8](#) and [Figure 9](#). 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.

6.0 Maintenance

To keep the L-847 circuit selector switch operating efficiently, follow a preventive maintenance schedule. Refer to [Table 7](#). Refer to FAA AC 150/5345-5A for more detailed information.

Table 7: 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.

6.1 Preventative Maintenance

The ADB Safegate 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.

6.2 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 8:

Problem	Possible Cause	Corrective Action
1. Time delay PCB relays not activating	Blown fuse	Check and replace fuse F1, if necessary.
	No input voltage Internal +24VDC power supply damaged	Check terminal block TB1 terminals N and 120 for proper voltage (120VAC). 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, re-solder 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.

Table 8: (continued)

Problem	Possible Cause	Corrective Action
	Defective remote control switches	Replace, as necessary.
3. L-847 not working in remote control	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 7 .
	Damaged interlock switch	Replace interlock switch.

6.3 Circuit Selector Wiring Diagrams

Figure 10: 43C1643/1xx 1 of 4

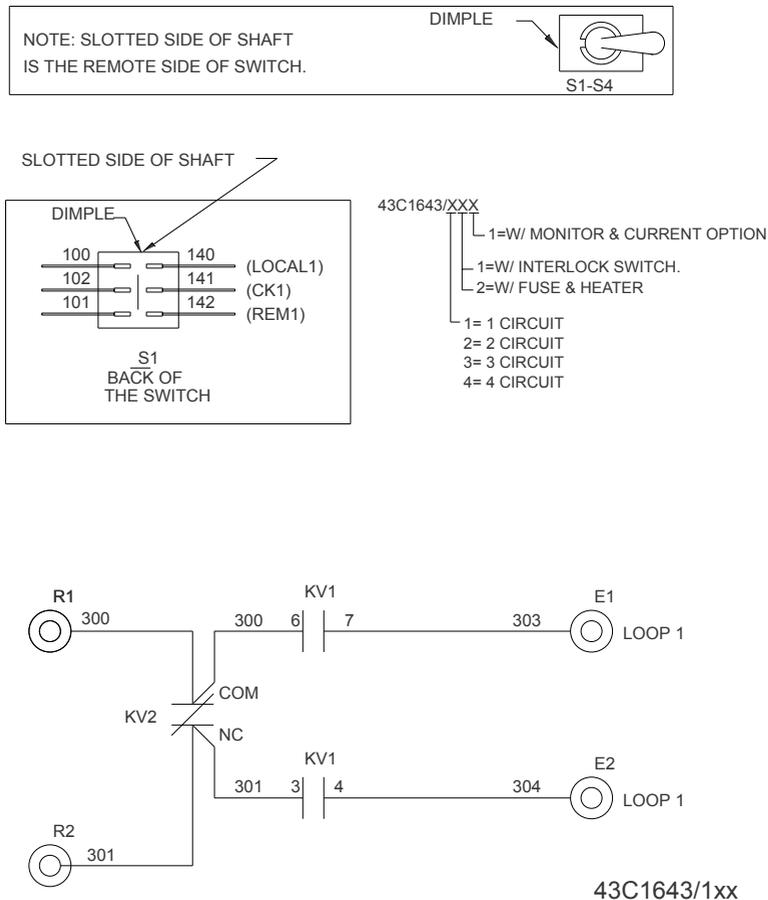
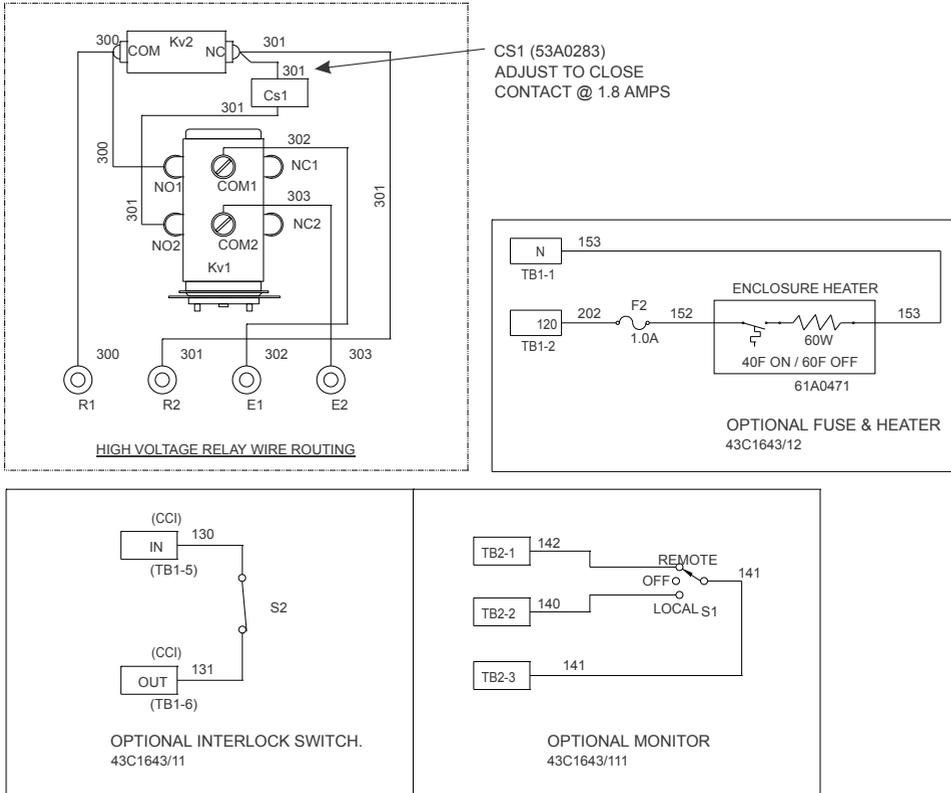


Figure 11: 43C1643/1xx 2 of 4

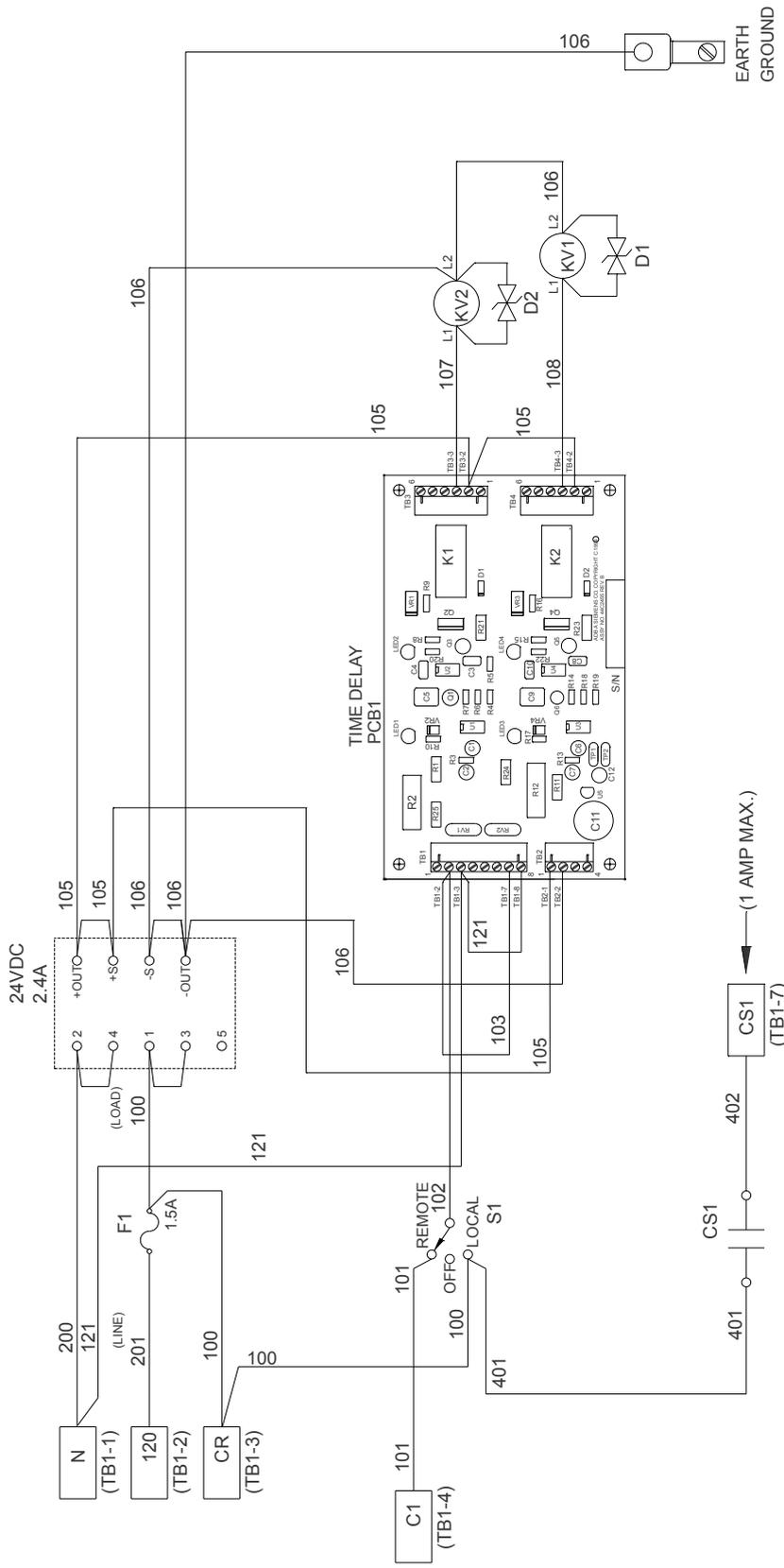
See Note 1



NOTE 1: USE DIAGRAM REV. H AND BEFORE TO SEE PREVIOUS KV1 RELAY WIRING FOR "KILOVAC" RELAY.

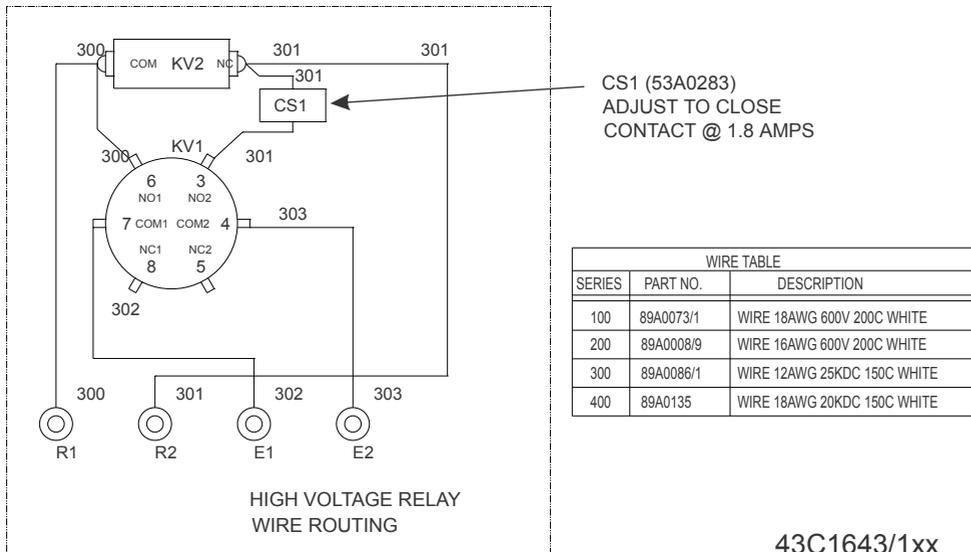
43C1643/1xx I

Figure 12: 43C1643/1xx 3 of 4



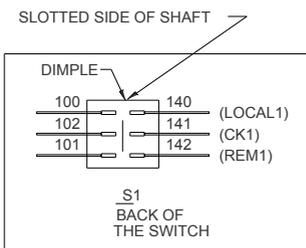
43C1643/1xx I

Figure 13: 43C1643/1xx 4 of 4

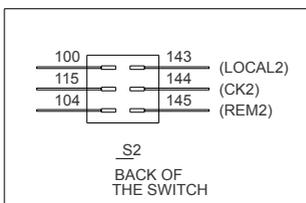


43C1643/1xx I

Figure 14: 43C1643/2XX 1 of 6



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



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

43C1643/2XX K

Figure 15: 43C1643/2XX 2 of 6

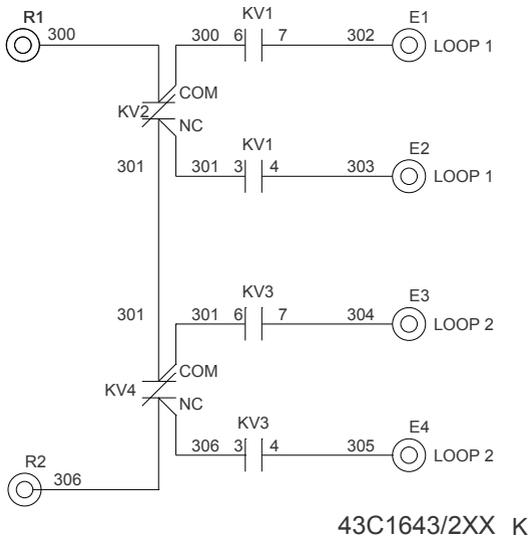
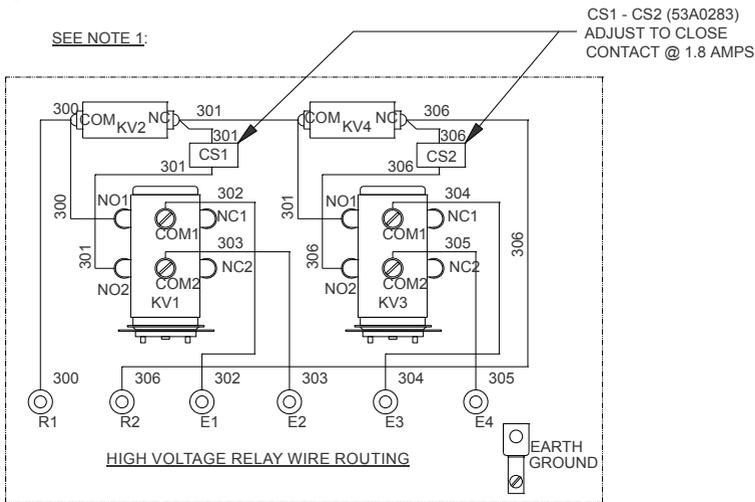
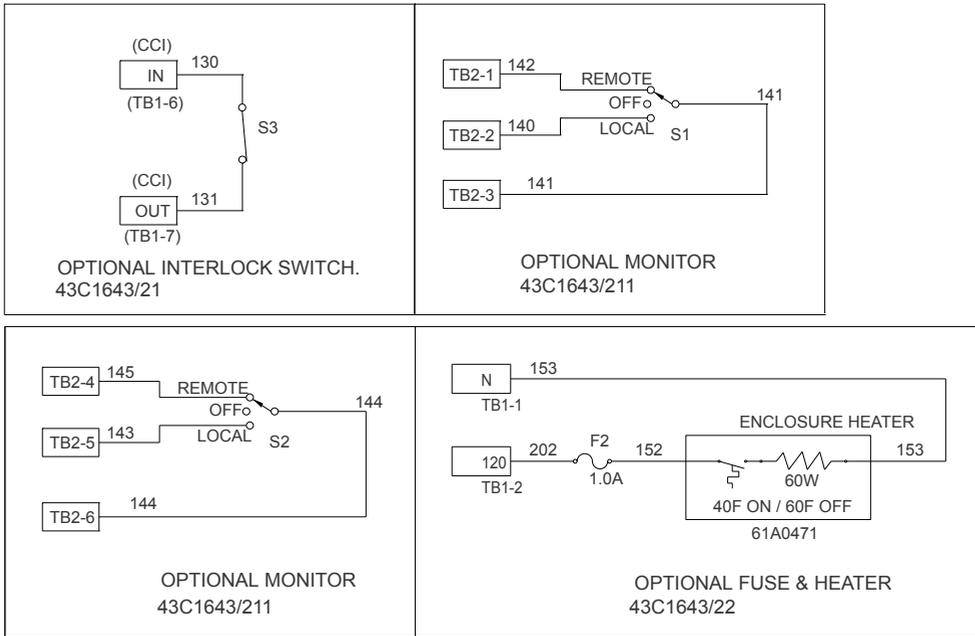


Figure 16: 43C1643/2XX 3 of 6



43C1643/2XX K

Figure 17: 43C1643/2XX 4 of 6



43C1643/2XX K

Figure 20: 43C1643/3xx 1 of 5

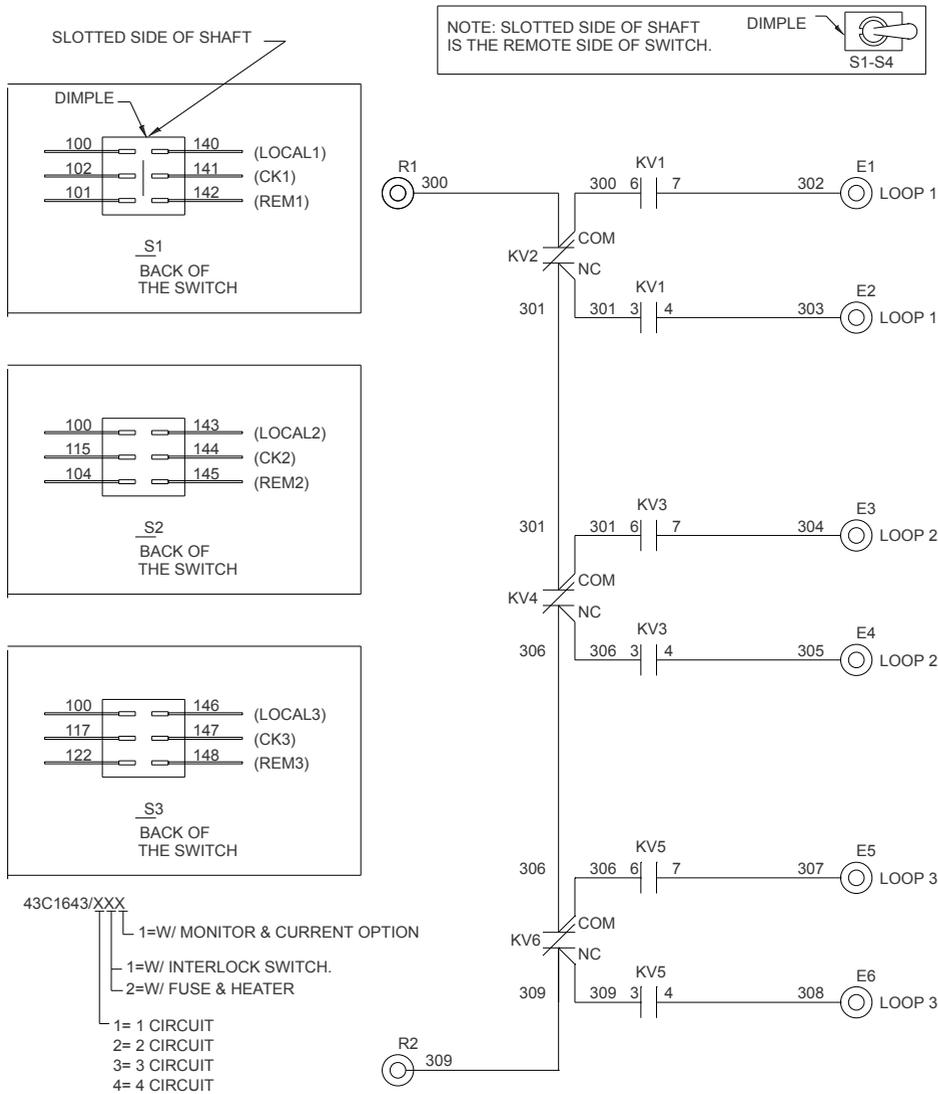
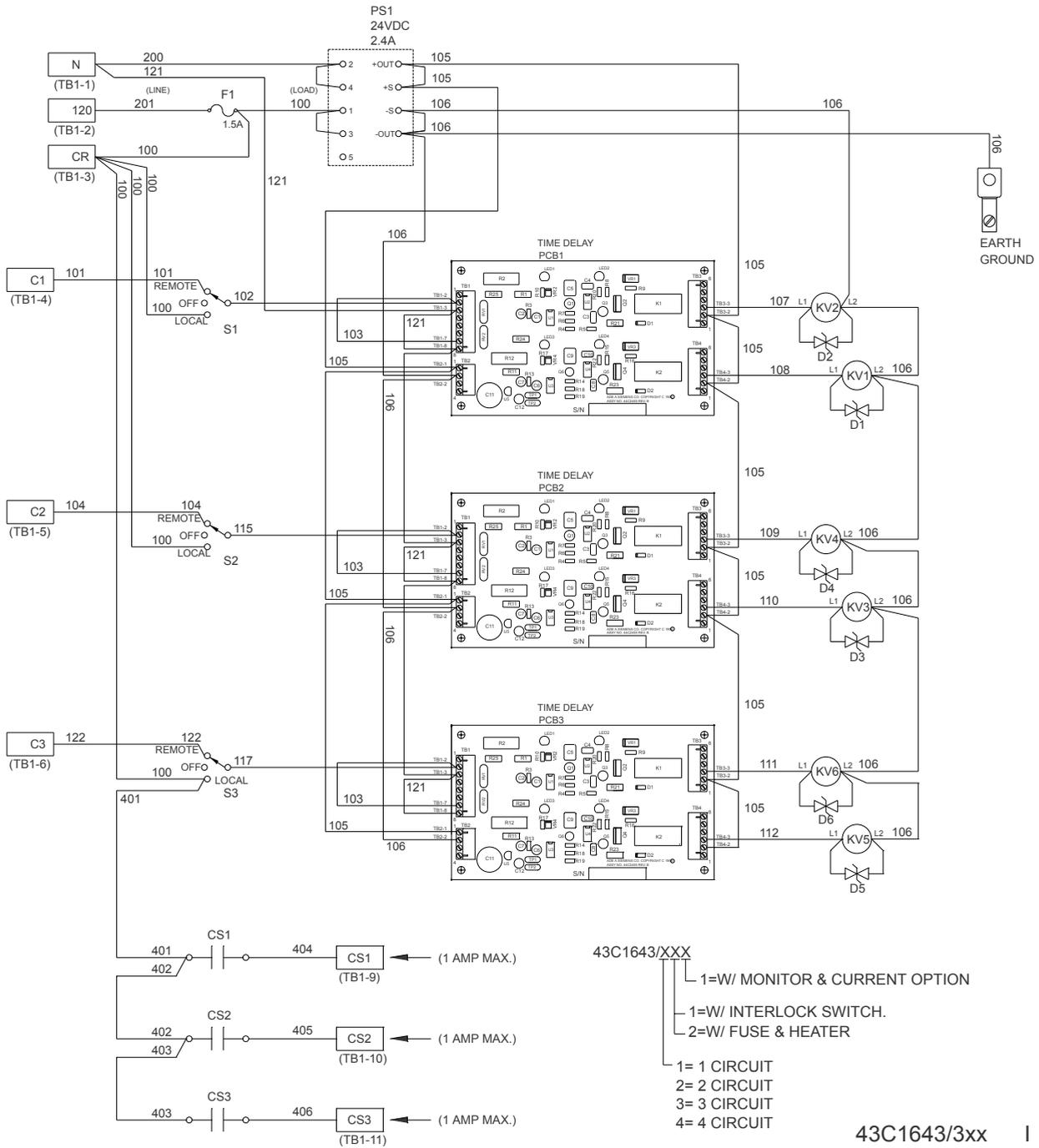
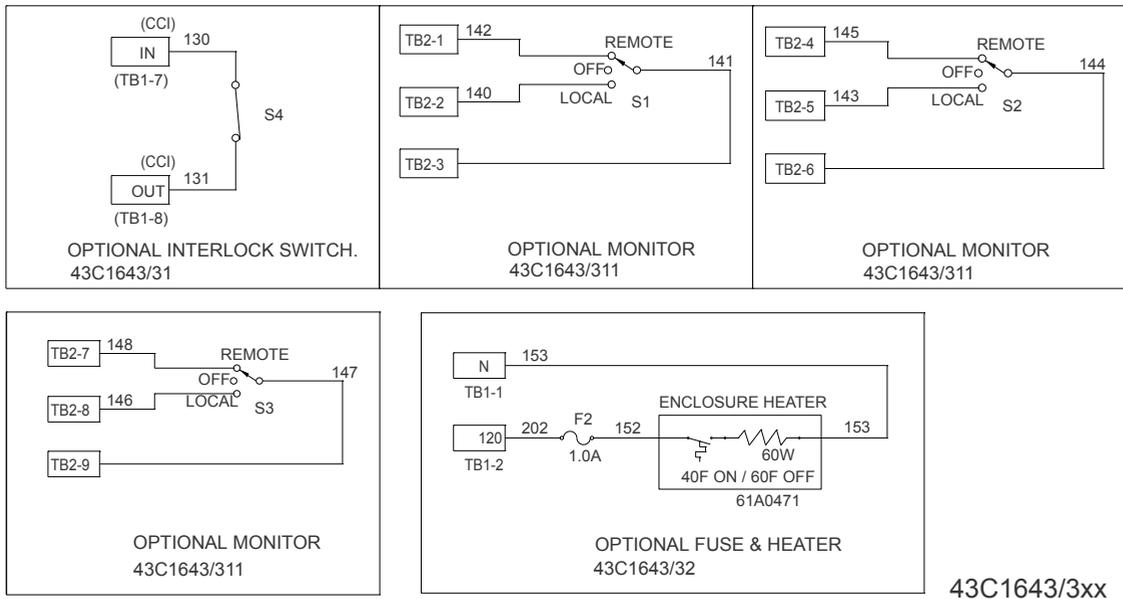


Figure 21: 43C1643/3xx 2 of 5



43C1643/3xx I

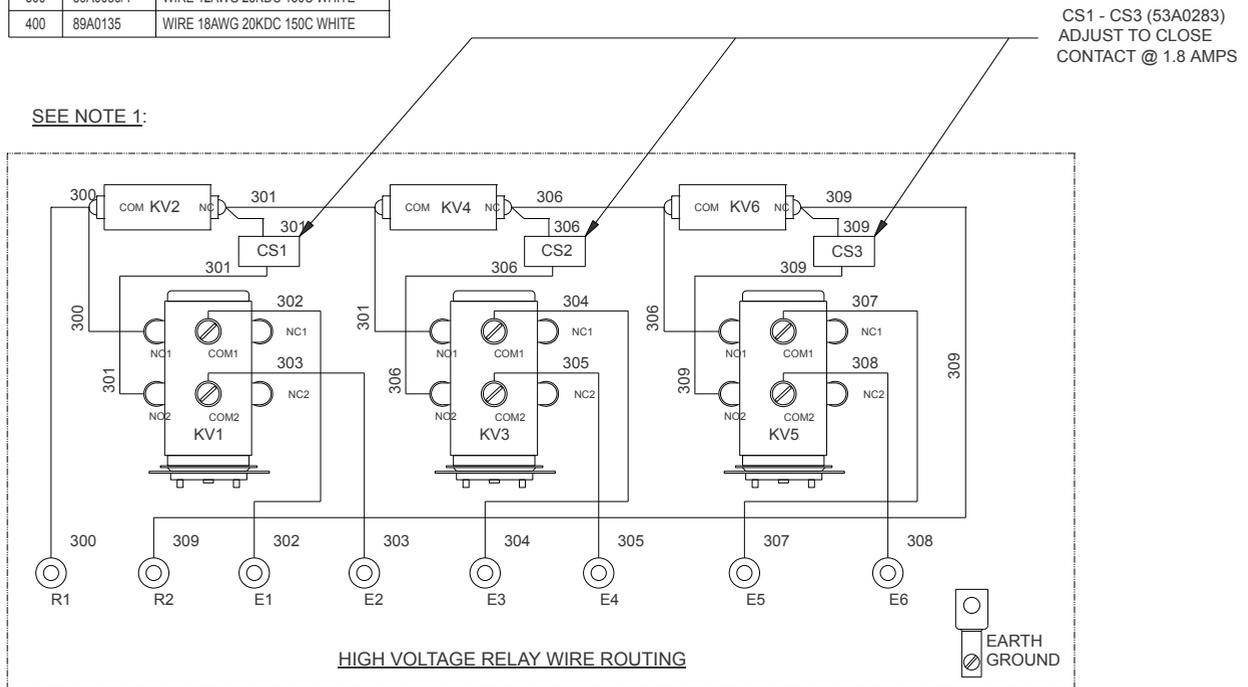
Figure 22: 43C1643/3xx 3 of 5



43C1643/3xx I

Figure 23: 43C1643/3xx 4 of 5

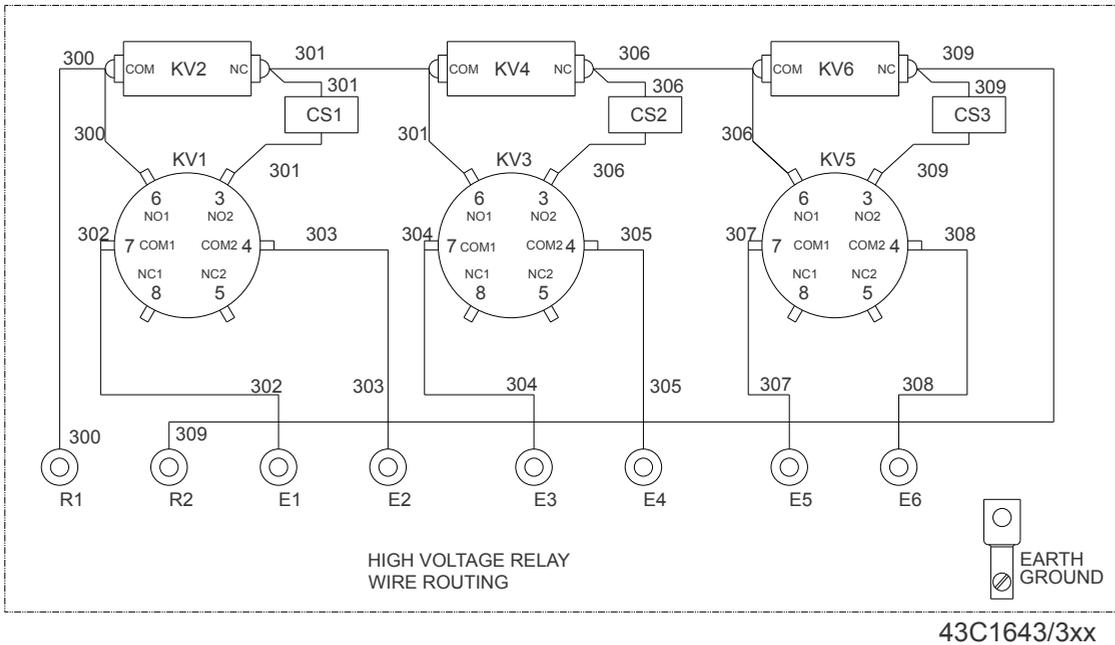
WIRE TABLE		
SERIES	PART NO.	DESCRIPTION
100	89A0073/1	WIRE 18AWG 600V 200C WHITE
200	89A0008/9	WIRE 16AWG 600V 200C WHITE
300	89A0086/1	WIRE 12AWG 25KDC 150C WHITE
400	89A0135	WIRE 18AWG 20KDC 150C WHITE



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

43C1643/3xx I

Figure 24: 43C1643/3xx 5 of 5

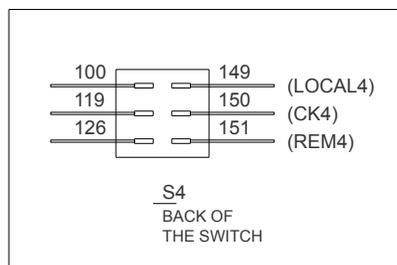
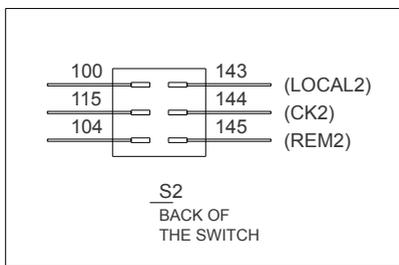
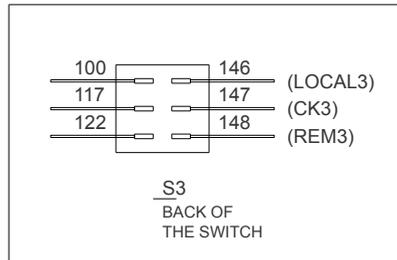
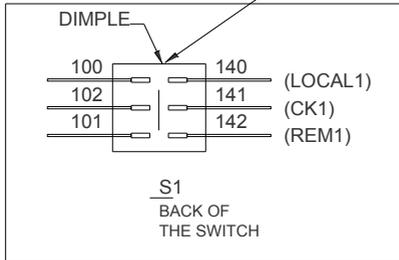


43C1643/3xx I

Figure 25: 43C1643/4xx 1 of 6



SLOTTED SIDE OF SHAFT

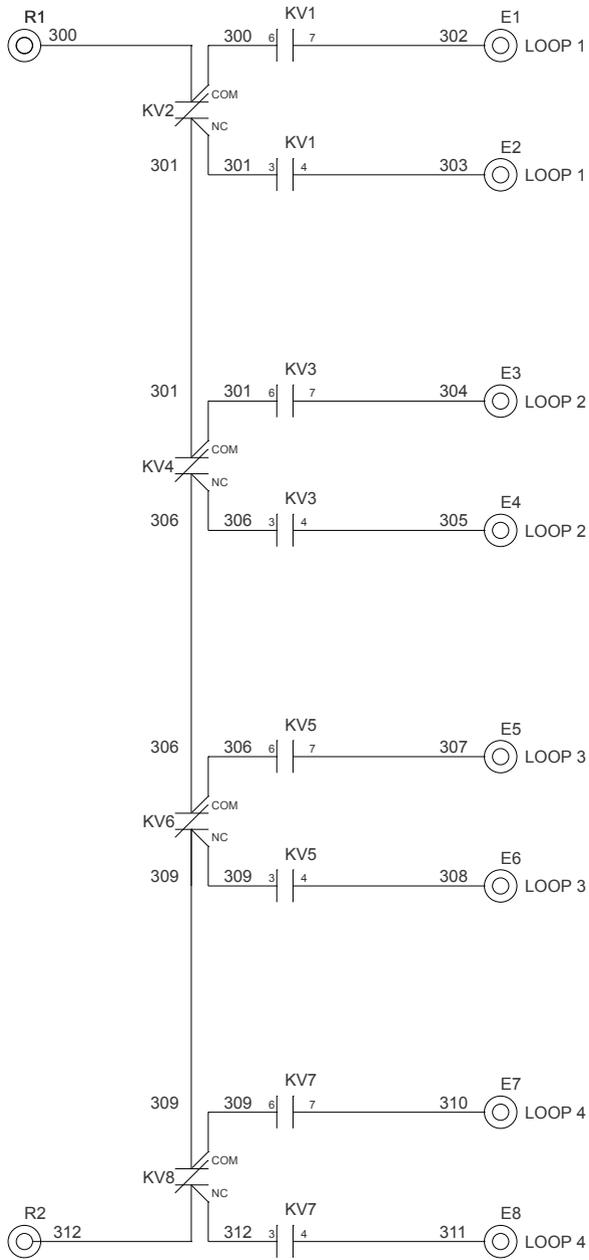


43C1643/XXX

- 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

43C1643/4xx I

Figure 26: 43C1643/4xx 2 of 6



43C1643/4xx I

Figure 27: 43C1643/4xx 3 of 6

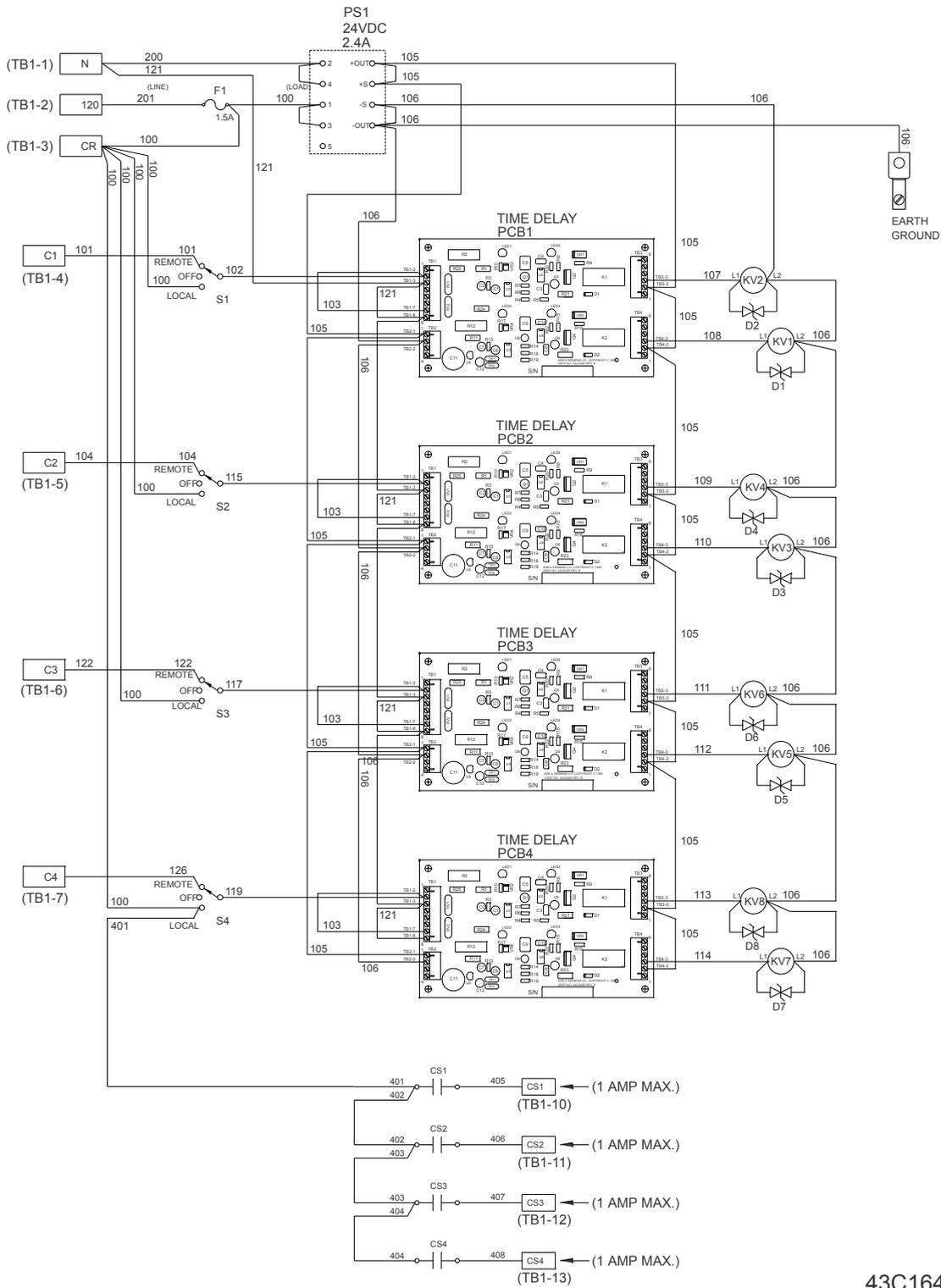


Figure 28: 43C1643/4xx 4 of 6

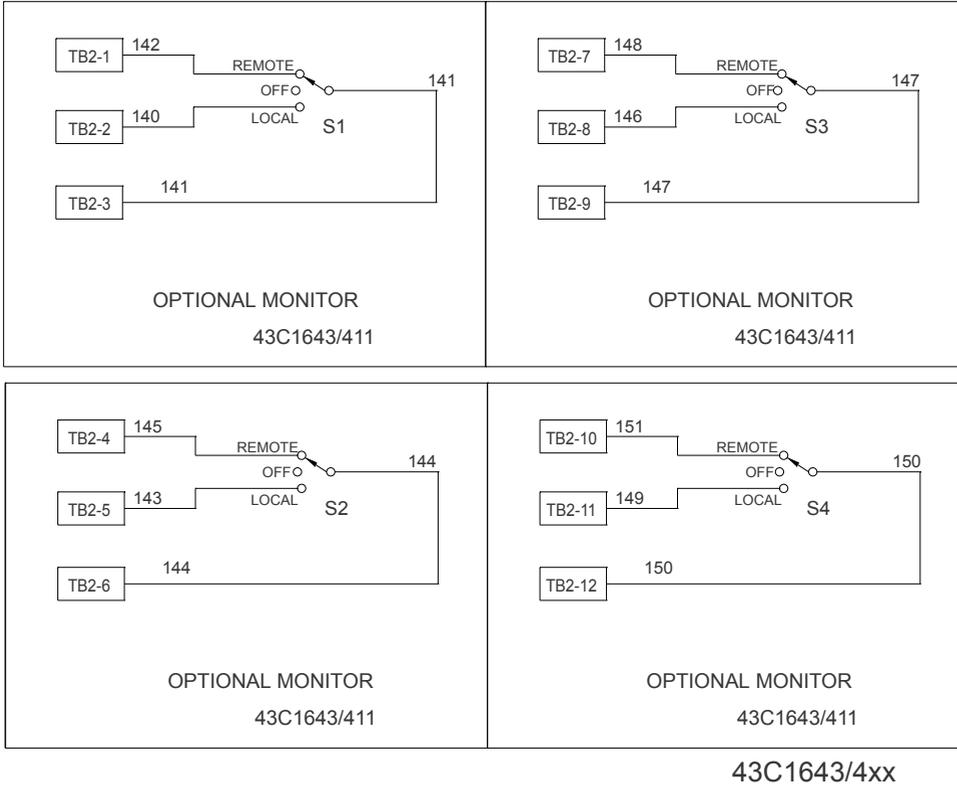
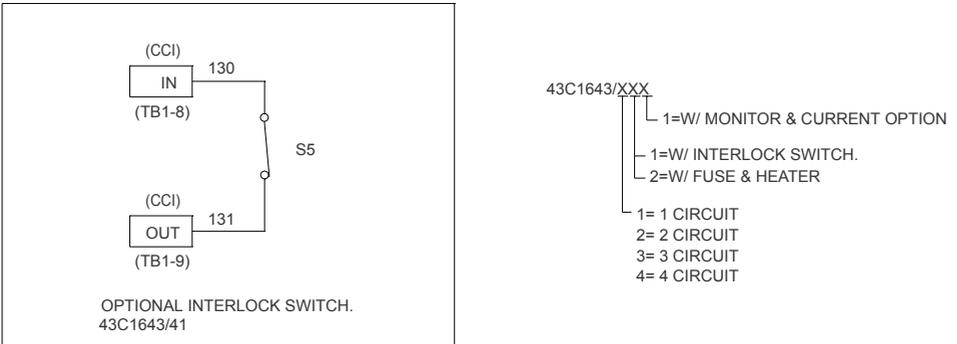


Figure 29: 43C1643/4xx 5 of 6



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

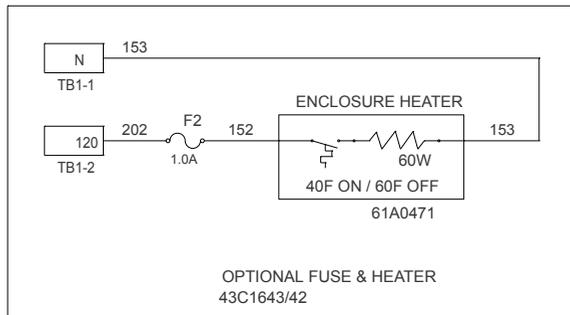
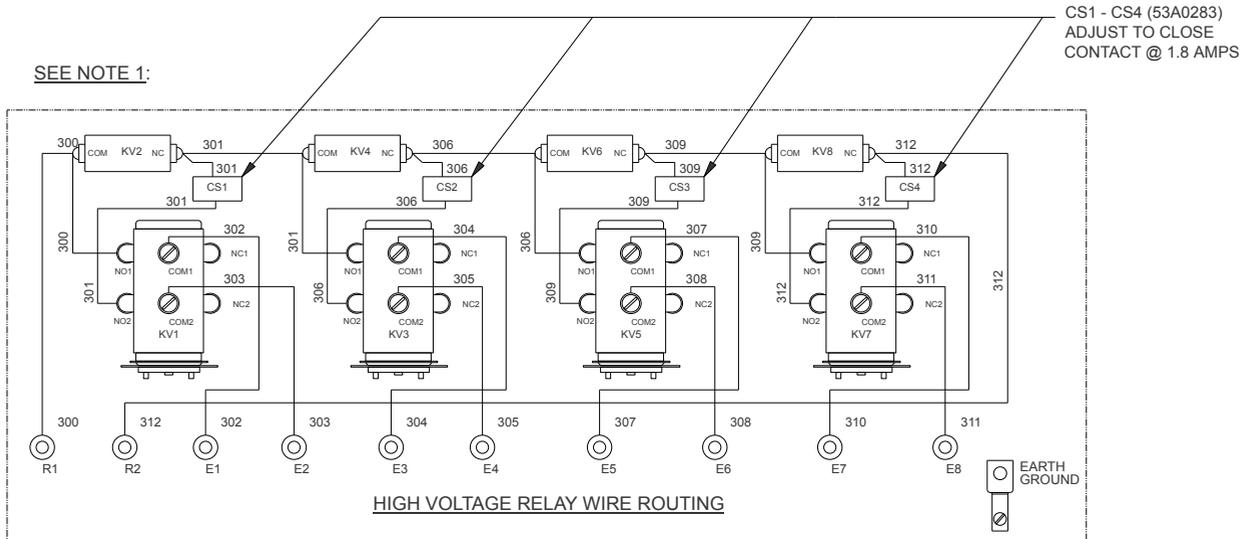


Figure 30: 43C1643/4xx 6 of 6



NOTE 1: USE DIAGRAM REV. H AND BEFORE TO SEE PREVIOUS KV1, KV3, KV5, AND KV7 RELAY WIRING USING "KILOVAC" RELAYS.

43C1643/4xx |

7.0 Parts

Ordering Code

44D4520 - X X X X

Circuit Control

- 1 = One Circuit
- 2 = Two Circuit
- 3 = Three Circuit
- 4 = Four Circuit

Interlock Switch

- 0 = Without Interlock Switch
- 1 = With Interlock Switch¹

Monitor and Current Sensor

- 0 = Without Monitor and Current Sensor
- 1 = With Remote/Local Monitor and Current Sensor²

Type

- 0 = Standard L-847
- R = Reverse L-847⁴

Enclosure

- 0 = Standard NEMA 4 Enclosure³
- 1 = Stainless Steel NEMA 4 Enclosure⁴
- 2 = Fiberglass NEMA 4X Enclosure with Heater^{3,4}

Notes

- ¹ Used to switch CCR off when L-847 door is opened
- ² Remote/Local Monitor provides separate dry contact closures to indicate Remote or Local control status. The current sensor provides separate 120 VAC outputs indicating current is present on one of the L-847 outputs.
- ³ Enclosure painted aviation orange
- ⁴ Not ETL Certified

7.1 Parts Diagrams

Figure 31: Circuits with 1 or 2 loops

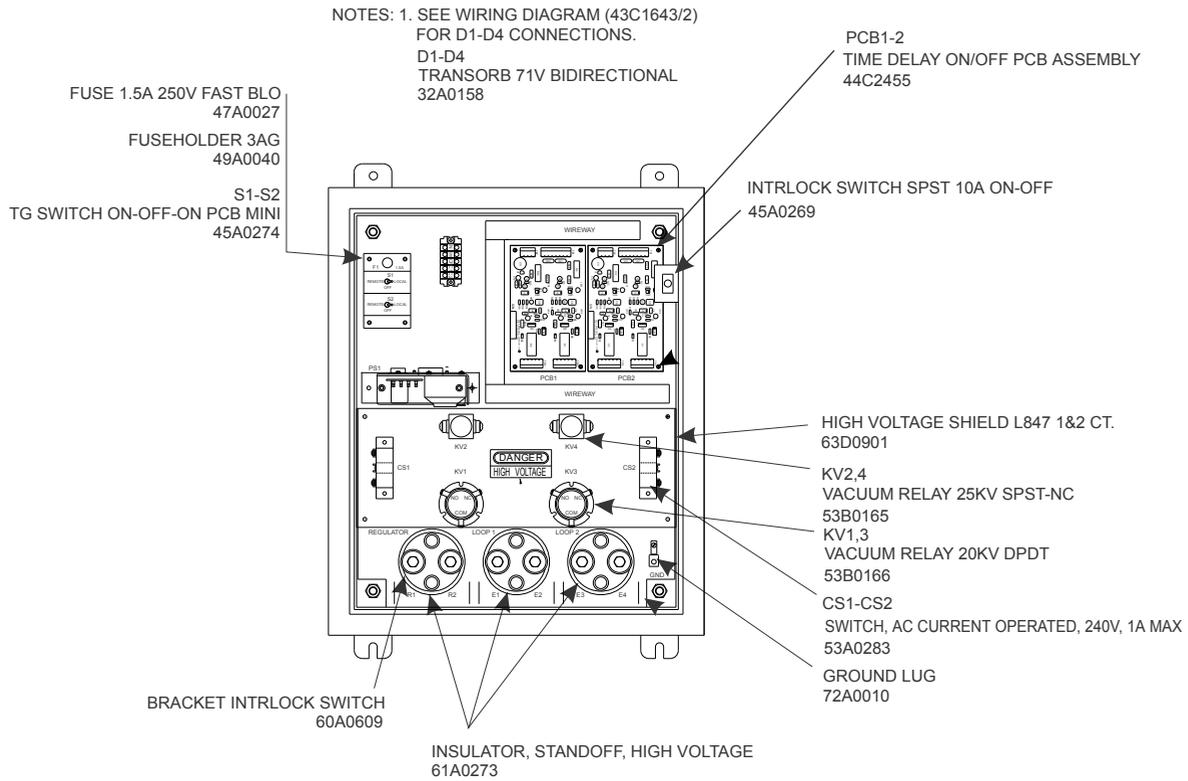
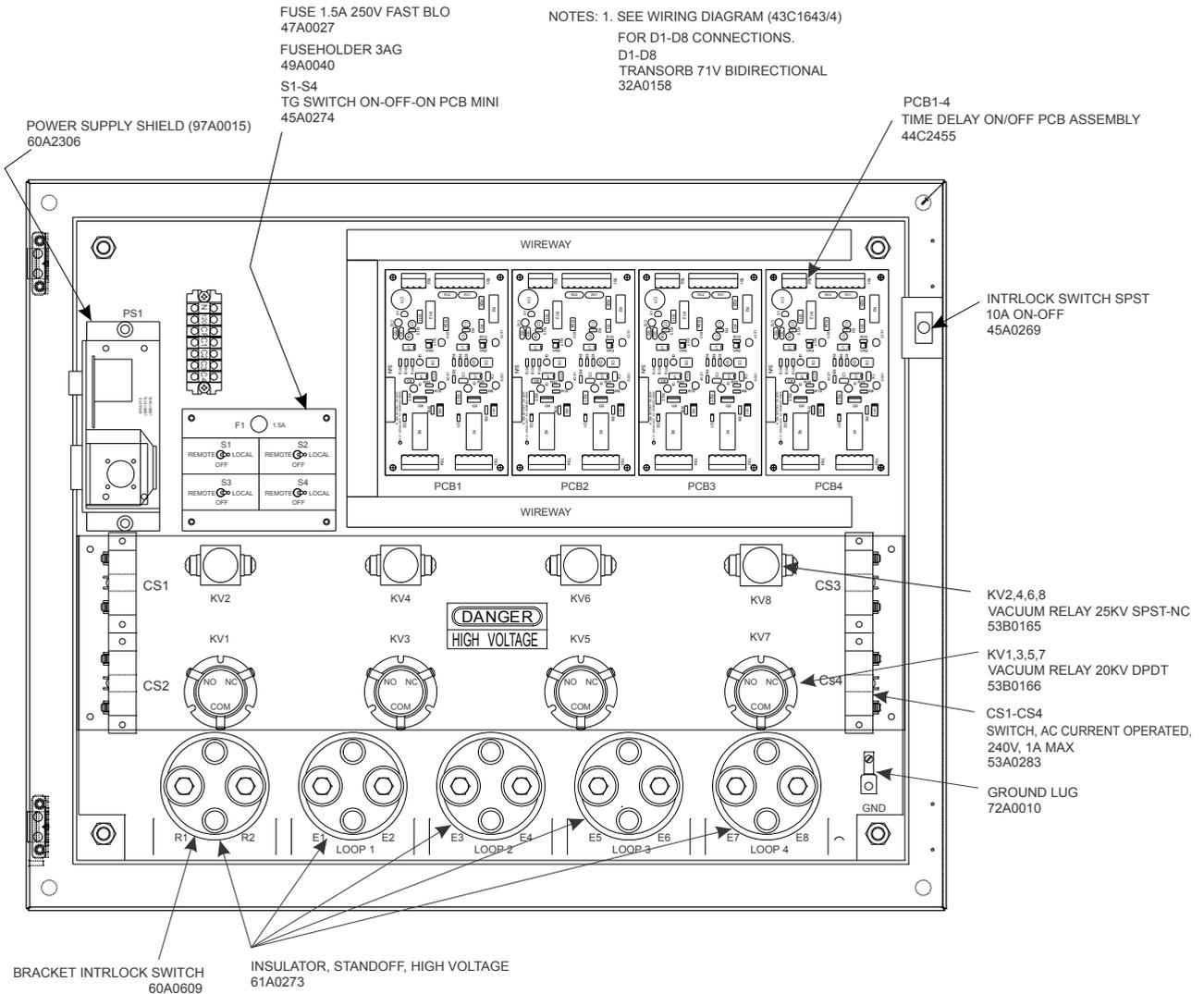


Figure 32: Circuits with 3 or 4 loops



7.2 Spare Parts

Create a sufficiently large stock of spare parts to maintain the unit and the fixtures in the field. Consider acquiring approximately 10% spare final assemblies (with a minimum quantity of 1) for the total amount of equipment in the field. This allows for repairs to be made in the shop. Components that are more likely to need replacement, such as prisms, prism gaskets and PCB subassemblies should be stocked in smaller quantities. For the unit, it is highly recommended to have at least one entire unit as a spare, or for larger installations, at least 10% of the total units installed.

See individual product manuals for recommended fixture spares.

For the unit, see the table below for spares.

- Consider acquiring 10% spares for critical components noted as (A) in the table below. If only a small number of units are installed, consider acquiring at least 1 of each of the components noted as (A) below.
- Also consider acquiring 1% spares for parts noted as (B) in the table below. If it is important to have a robust level of spare parts on hand, and only a small number of units are installed, consider acquiring 1 of each of the components noted as (B) below.

Table 9: Spare Parts

Part Number	Description	Location	Notes	Spares
47A0049	Fuse, 2A, SB	F1		A
57A0093	Circuit breaker	CB1		B
72A0010	GROUND LUG		See Figure 31 and Figure 32	
53A0283	SWITCH, AC CURRENT OPERATED, 240V, 1A MAX	CS1-CS2	See Figure 31	
		CS1-CS4	See Figure 32	
53B0166	VACUUM RELAY 20KV DPDT	KV1,3	See Figure 31	
		KV1,3,5,7	See Figure 32	
53B0165	VACUUM RELAY 25KV SPST-NC	KV2,4	See Figure 31	
		KV2,4,6,8	See Figure 32	
63D0901	HIGH VOLTAGE SHIELD L847 1&2 CT		See Figure 31 and Figure 32	
45A0269	INTERLOCK SWITCH SPST 10A ON-OFF		See Figure 31 and Figure 32	
44C2455	TIME DELAY ON/OFF PCB ASSEMBLY	PCB1-2	See Figure 31	
44C2455	TIME DELAY ON/OFF PCB ASSEMBLY	PCB1-4	See Figure 32	
47A0027	FUSE 1.5A 250V FAST BLO		See Figure 31 and Figure 32	
49A0040	FUSE HOLDER 3AG		See Figure 31 and Figure 32	
45A0274	TG SWITCH ON-OFF-ON PCB MINI	S1-S2	See Figure 31 and Figure 32	
60A0609	BRACKET INTERLOCK SWITCH		See Figure 32	
61A0273	INSULATOR, STANDOFF, HIGH VOLTAGE		See Figure 32	

Appendix A: SUPPORT

Our experienced engineers are available for support and service at all times, 24 hour/7 days a week. They are part of a dynamic organization making sure the entire ADB SAFEGATE is committed to minimal disturbance for airport operations.

ADB SAFEGATE Support

Live Technical Support - Americas

If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.

ADB SAFEGATE **Americas Technical Service & Support (US & Canada): +1-800-545-4157**

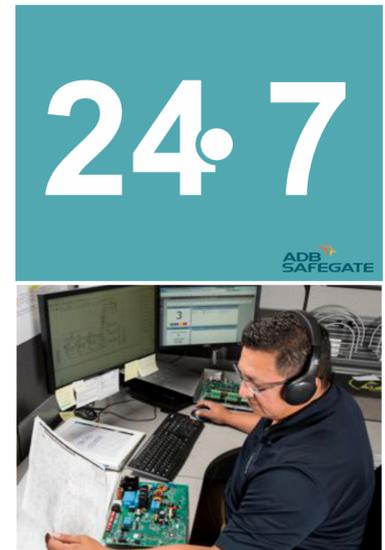
ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304

During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!

Before You Call

When you have an airfield lighting or system control system problem it is our goal to support airfield maintenance staff as quickly as possible. To support this effort we ask that you have the following information ready before calling.

- The *airport code*
- If not with an airport, then company name (prefer customer id number)
- Contact phone number and email address
- Product with part number preferable or product number
- Have you reviewed the product's manual and troubleshooting guide
- Do you have a *True RMS* meter available (and any other necessary tools)
- Be located with the product ready to troubleshoot



Note

For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or

Brussels: +32 2 722 17 11

Rest of Europe: +46 (0) 40 699 17 40

Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.

China: +86 (10) 8476 0106

A.1 ADB SAFEGATE Website

The ADB SAFEGATE website, www.adbsafegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.

A.2 Recycling

A.2.1 Local Authority Recycling

The disposal of ADB SAFEGATE products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

A.2.2 ADB SAFEGATE Recycling

ADB SAFEGATE is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. ADB SAFEGATE offers a recycling program for our products to all customers worldwide, whether or not the products were sold within the EU.

ADB SAFEGATE products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labeled as follows:

- For *ROHS/WEEE* Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

ADB SAFEGATE will continue to monitor and update according for any future requirements for *EU directives* as and when *EU member states* implement new *regulations* and or *amendments*. It is our aim to maintain our *compliance plan* and assist our customers.

Company Addresses

ADB SAFEGATE	ADB SAFEGATE, Belgium: Leuvensesteenweg 585, B-1930 Zaventem Belgium
Contact: Tel.: +32 2 722 17 11, Fax: +32 2 722 17 64	Email: marketing@adbsafegate.com Internet: www.adbsafegate.com
Americas LLC	ADB SAFEGATE, Americas: 977 Gahanna Parkway, Columbus, OH 43230 USA
Contact: Tel.: +1 (614) 861 1304, Fax: +1 (614) 864 2069	Email: sales.us@adbsafegate.com Internet: www.adbsafegate.com
ADB SAFEGATE Sweden AB	ADB SAFEGATE, Sweden: Djurhagegatan 19 SE-213 76 Malmö Sweden
Contact: Tel.: +46 (0)40 699 17 00, Fax: +46 (0)40 699 17 30	Email: marketing@adbsafegate.com Internet: www.adbsafegate.com
ADB SAFEGATE Airfield Technologies Ltd. China	ADB SAFEGATE, China: Unit 603, D Block, CAMIC International Convention Center, No 3, Hua Jia Di East road, ChaoYang district, Beijing 100102 P.R. China
Contact: Tel.: +86 (10) 8476 0106, Fax: +86 (10) 8476 0090	Email: china@safegate.com Internet: www.adbsafegate.com
ADB SAFEGATE Germany GmbH	ADB SAFEGATE Germany GmbH, Mannheim: Konrad-Zuse-Ring 6, D-68163 Mannheim Germany
Contact: Tel.: +49 (621) 87 55 76-0, Fax: +49 (621) 87 55 76-55	Email: marketing@adbsafegate.com Internet: www.adbsafegate.com



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