

Scully ST-47C Groundhog

Technical Manual



ST-47C Series Self-Proving Vehicle Earthing Verification System



ST-47C Groundhog - Technical Manual

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Self-Proving Vehicle Earthing Verification System

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General

The ST-47C Groundhog is an intelligent system that continuously and automatically monitors the earthing connection during loading operations at the gantry (loading terminal). The Groundhog is designed to immediately shut down the loading operation if the earth connection is broken.

The Groundhog control monitor is mounted at the gantry. Indicator lights on the cover of the control monitor are visual reference that proper earthing has or has not been accomplished.

The Groundhog requires that each vehicle be equipped with a specially designed Scully electronic Ground Ball or Ground Bolt. Before the loading operation can begin, the controller must see an intelligent return signal from the Ground Ball or Ground Bolt, indicating that a proper earthing connection has been made.

The Groundhog frustrates typical cheating methods and malfunctioning problems that can lead to earthing vehicles improperly. The ST-47C Groundhog insures that unless the proper earthing connection has been made, the loading process will not begin. It will automatically shut down the loading operation if the ground is broken.

1.1 Description

The ST-47C Groundhog can be wired into your existing Scully Overfill Prevention system for the ultimate safety system. One connection gives you overfill and earthing protection. This single connection simplifies loading and eliminates the need for additional plugs and cables at the gantry. When wired into an overfill prevention system, the ST-47C Groundhog utilizes a spare conductor in the existing Scully overfill prevention plug and cable together with a special Scully Ground Bolt mounted on each vehicle. The Scully Ground Bolt sensing lead is wired to the Scully overfill prevention socket.

The ST-47C Groundhog can be used as a completely independent system. This system is ideal for top loading or applications where a Scully Overfill Prevention System is not in use. The ST-47C Groundhog control monitor connects to a heavy duty Scully Sculcon® Junction Box Kit with attached cable and special quick release snap-on plug. The Scully Ground Plug connects to a specially designed electronic Scully Ground Ball mounted on each vehicle. The controller, in conjunction with the Ground Ball provides and verifies vehicle earthing before loading can begin. The controller must receive an electronic return signal from the Ground Ball throughout the loading operation.

Self-Proving Vehicle Earthing Verification System

General

1.1.1 Model Designations

The ST-47C Controller is available in 120VAC or 240VAC models, with or without control (Bypass) Switch.

Model suffix (E) = Explosion-proof Enclosure, (L) = Indicator Lights, (K) = Key Lockable Bypass Switch.

Model	Description
ST-47C-120 EL	Controller in Explosion-proof Enclosure with Indicator Lights, 120VAC
ST-47C-120 ELK	Controller in Explosion-proof Enclosure with Indicator Lights and Key-lockable Bypass Switch, 120VAC
ST-47C-240 EL	Controller in Explosion-proof Enclosure with Indicator Lights, 240VAC
ST-47C-240 ELK	Controller in Explosion-proof Enclosure with Indicator Lights and Key-lockable Bypass Switch, 240VAC

1.1.2 Explosion Proof Enclosure

Suffix "E" in the model number indicates controller is in an explosion-proof enclosure suitable for hazardous areas. Conduit holes are provided in the enclosure for electrical access. The installer must install Exd cable glands (or conduit and seal fittings) according to local codes.

1.1.3 Indicator Lights

Suffix "L" in the model number indicates red and green indicator lights on the controller enclosure. These lights indicate the following conditions:

GREEN	RED	Condition
ON	OFF	A good earth (ground) connection is verified Controller output is in permissive state i.e. permit to load.
OFF	ON	A good earth (ground) connection is not verified. Controller output is in non-permissive state i.e. no permit to load.
OFF	OFF	No power to the unit or Bypass Control Switch is in OFF or BYPASS position.

1.1.4 Bypass Control Switch

Adding the suffix "K" to the model number adds a lockable two-position control switch to the enclosure. In the "NORMAL" position, the unit will operate normally, with verification of proper earth (ground) connection causing the output relay to become energized (i.e. closed output contact). In the "BYPASS" position, power to the unit is switched "OFF" and the normally open relay contacts are bypassed to permit emergency operation of the equipment, without earthing verification.

For normal operation, this switch should always be set in the NORMAL position. The switch is enclosed in lockable box to allow locking with a user provided padlock.

CAUTION: When in "BYPASS" mode the earth ground verification is DISABLED and the system does not provide earth (ground) connection verification.

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General

1.2 Technical Specifications

Temperature Range	-40°C to +60°C (-40°F to +140°F)				
Power Requirements	120VAC Models: 100-130 VAC, 50/60 Hz, 20VA Max.* 240VAC Models: 200-250 VAC, 50/60 Hz, 20VA Max. * *20VA does not include circuits controlled by the output relay contact				
Vehicle Interface	Scully Ground Ball (via Ground Ball connector plug), Scully Ground Bolt (via plug for overfill prevention socket), Clamp connection (Resistive).				
Output Relay	One normally open volt-free contact rated 250VAC, 5A resistive max. The output contact closes when a proper earth connection has been established.				
Response Time	0.5 second maximum				
Indicator Lights	Output status indicator lights: Red: Non-permissive Green: Permissive				
Output Control Fuse	Internal 5 Ampere				
Connections	Provided by internal terminal strips.				
Enclosure	Explosion-proof weatherproof IP65				
Dimensions	See Appendix 4 for outline drawing				
Weight	12 Kg (26 Lbs.)				
Approvals	Ex db [ia Ga] mb IIB T5 Gb (Tamb = -40°C to 60°C) Baseefa17ATEX0158X IECEX BAS 17.0134X				
Standards Compliance	IEC 60079-0:2017; IEC 60079-1:2014; IEC 60079-11:2023; IEC 60079-18:2014				
Entity Parameters	Um 127 or 253 VRMS				
	Uo 58V	Io 16mA	Po 121mW	Ci 0	Li 0
	IS Area Load Maximums				
	Group	Capacitance Ci (uF)	Inductance Li (mH)	L/R Ratio(uH/Ω)	
	IIC	0.03	147	218	
	IIB	0.23	590	872	
	IIA	0.8	1180	1745	
ATEX Specific Conditions for Safe Use	• Flamepaths must not be repaired. • Wipe with damp cloth to reduce the potential for electro-static discharge. See instructions. • Do not open when an explosive gas atmosphere is present.				

The enclosure is rated to IP65 per IEC 60529. The rating of the enclosure is negated if the holes in the enclosure are unplugged/unscrewed or any holes are drilled into the enclosure. Cover screws to be minimum grade A2-70 stainless steel. The ST-47C control unit has been designed to be impact-resistant. Do not subject to excessive mechanical or thermal stresses. Do not allow the unit to come in contact with aggressive substances. The ST-47C may only be repaired by replacing the internal control module. The internal control module is nonrepairable.

General

1.3 Accessory Equipment

In addition to the control unit, a plug and cable assembly is needed to provide the inter-connection from the ST-47C Control Unit to the vehicle.

Scully highly recommends the use of our Sculcon® Junction Box with Plug and Cable assembly. Use of Sculcon junction box simplifies system installation and provides for easy service of the plug and cable assembly for maintenance. Wiring the plug and cable assembly directly into the bottom of the ST-47C enclosure is not recommended and will result in greatly increased maintenance time and difficulty when the plug and cable assembly requires maintenance.

1.3.1 Sculcon Junction Box with Plug and Cable Assembly

One of the following junction box and cable kits is needed to make connection to a vehicle when fitted with Scully Ground Ball.

Model	Description
SC-47	Sculcon Junction Box Kit with 6m (20') straight cable and ground-proving plug for connection to vehicle mounted ground-proving ball (independent system).
SC-47CC	Sculcon Junction Box Kit with 10m (32') coiled cable and ground-proving plug for connection to vehicle mounted ground-proving ball (independent system).
SC-47CC-CLMP	Sculcon Junction Box Kit with 10m (32') coiled cable and isolated jaw, static ground clamp for connection to vehicle chassis (independent system). This Junction Box and Clamp Kit is required for connection directly to the frame of the vehicle. *

* Use of this cable requires operation of the ST47C system in its resistive verification configuration. Such use does not use a Ground Bolt or Ground Ball and, as such, does not have the anti-cheating advantages provided by the Ground Bolt or Ground Ball systems. Contact Scully Technical Services for more information.

For a list of cables that integrate the ST-47C into Overfill Prevention systems, consult Scully Tech Data Sheet 60614.

The ST-47C control system is typically installed in areas that are classified as hazardous locations due to nature of the products being loaded. Installation of the control unit and accessories must therefore be done by qualified personnel in accordance with all national and local regulations (codes) governing the installation of electrical equipment in hazardous locations.

It is essential that the ST-47C control unit and accessories be installed and used in accordance with the detailed specifications and instructions in this manual. Installations that violate national and local regulations (codes) for installation of electrical equipment in hazardous locations and/or details in this manual may lead to unsafe operation.

Intrinsically safe wiring to/from TB2 at the bottom of the control module must enter/exit the bottom opening in the control unit enclosure labeled "Intrinsically Safe Entry". Intrinsically safe wiring must be kept physically separated from any other wiring.

2.1 Mechanical Installation

When choosing a location on the loading rack for the control unit, the lights on the front of the control unit should be readily visible and within easy reach of the user. The control unit should be mounted vertically, in a location where the cover can open for servicing. (See Diagram 61442 in Appendix 4 for installation.)

Refer to the Outline Drawing 31412 in Appendix 4 for physical dimensions, location of the mounting bolts, electrical cable/conduit entry locations and enclosure earth bonding stud. The enclosure earth-bonding stud is provided for proper electrical bonding (earthing) of the enclosure to earth (ground). Use only the three conduit entry holes provided for wiring. The top two holes are for power and control wiring. The bottom hole is for intrinsically safe sensor wiring only. Do not drill any additional conduit holes in the enclosure; doing so violates the enclosure's hazardous location approval and voids the warranty.

To avoid future maintenance issues regarding water infiltration into the enclosure via the electrical cable entries, we strongly recommend the following precautions:

- Minimize long vertical cable (or conduit) runs into the top of the enclosure as long vertical runs promote water channeling to the cable gland.
- The cable glands at the top of the enclosure should be very carefully installed, taking extra precaution to make certain that the installation is proper and sealed (as required by code).
- Must seal all enclosure cable gland entries to maintain IP65 rating and protect against water infiltration. Install a fiber washer between the cable gland and the enclosure.

2.2 Electrical Installation

Refer to the Installation Wiring Diagrams in Appendix 4.

All cable entry fittings, junction boxes, connections, wiring, etc. are to be provided by the installer. Explosion- proof cable glands should be employed for cable entry. If conduits are used for cable entry, seal fittings must be installed in each conduit.

There are three holes in the enclosure for cable entry. Two holes in the top of the enclosure are for mains power and control output wiring. One hole in the bottom of the enclosure, labeled "Intrinsically Safe Entry" is for connection to ground verifications, via a Scully Sculcon Junction Box.

WARNING: *The electrical cable entry in the bottom of the enclosure marked "INTRINSICALLY SAFE ENTRY" must only be used for vehicle interconnection (via plug and cable assembly). To maintain intrinsic safety, this cable entry must not be used for any other wiring. DO NOT ROUTE MAINS POWER THROUGH THIS HOLE.*

2.2.1 Power Connections

Route the mains power wires through the top left-hand entry hole in the top of the enclosure. Connect mains power wires to the appropriate terminals on the terminal block (strip) on the metal bracket in the enclosure. The Power terminals are marked E, N & L, also shown in wiring diagram.

NOTE: *The ST-47C Control Module is protected by a field replaceable 1A high interrupt capacity fuse in the enclosure. The fuse (F1) is located next to the terminal strip on metal bracket.*

2.2.2 Enclosure Earth (Ground) Connection

Connect a wire (1.5mm² minimum) from the enclosure-bonding stud to earthed metallic structure of the gantry (rack).

2.2.3 Control Output (Controlled Circuit) Connections

Route the control output wiring through the top right hand entry hole in the enclosure and connect to output contact terminals, indicated on the terminal strip on metal bracket. The output control contact is open when no connection from the controller is made to a vehicle (idle state). The output control contact closes when a proper static discharge path (earthing) between the gantry and the vehicle has been established (or when optional bypass switch is in the "Bypass" position). The contact opens if the discharge path is broken or disconnected.

NOTE: *An internal field replaceable 5A high interrupt capacity fuse protects the output relay contact. The fuse (F2) is located on metal bracket.*

The output contact is rated 250VAC, 5A resistive maximum. It is used to close a valve or pump directly or by wiring it in series with other control contacts, such as a preset meter's control contacts. (See Diagram 61441, Typical Loading Rack Control in Appendix 4.) In addition it may also be connected to an input of a terminal automation system (TAS) to provide status of the controller's output to TAS.

Caution: *A valve or pump should be directly controlled by ST-47C's relay output contact. It should not go via the logic circuits of a TAS, as that can introduce unsafe failure modes into this emergency shutdown system. TAS may also control a valve or pump based on other conditions.*

2.2.4 Intrinsically Safe Connections to Sculcon Plug & Cable Unit

Signals from ST-47C to Sculcon Plug & Cable Unit are intrinsically safe. The intrinsically safe connections must only be made via the entry hole in the bottom of the enclosure. The connections are made to the terminal strip TB2 at the bottom end of the printed circuit board module. The wires must be 1.5mm² (18AWG) minimum conductor size. Connect wires to Sculcon as shown in the Wiring Diagram in Appendix 4. Use wire colors as indicated. If other than suggested color codes are used, this information should be so noted in the back of this manual for future reference and troubleshooting. All wiring installation should be in accordance with local wiring codes.

2.3 Initial System Checkout

2.3.1 Test Equipment

Scully suggests the use of Scully ST-2-DSWJ Universal Loading Rack Tester to perform system tests out as described below. The tester will expedite the initial system checkout of the ST-47C (when integrally wired with overfill).

While not required, the tester provides all of the proper overfill prevention system connections to verify the new installation without the need to secure an actual vehicle for testing.

- ST-2-DSWJ Tester has multiple socket configurations for connection to all Scully Sculcon Plug Models.

Note: *If the ST-47 is not being used integrally with a Scully overfill prevention system, you must provide a vehicle or simulation equipped with the ground verification device(s) installed.*

2.3.2 Operational Testing

Apply power to the ST-47C control unit (and overfill control units, if present).

If the ST-47 is not equipped with a Bypass Control Switch then the red lamp should be lit and the Green lamp should be off.

If the unit is equipped with a Bypass Control Switch, place Bypass Control Switch in the normal position. Verify that the Red lamp is lit and Green lamp is off.

Bypass Equipped Units only: Check status of lights with Bypass Control Switch in the following positions:

- NORMAL: Red light should be ON. Circuit is non-permissive
- BYPASS: Both lights should be OFF. Circuit is permissive

Installation

On units equipped with Bypass Control Switch: Return the Bypass Switch to the NORMAL position. The Bypass Switch should be kept under a lock (user provided) so that its setting cannot be tampered with.

Connect the Sculcon plug to the socket on the tester. Follow instructions provided with the tester. As the tester simulates a vehicle's overfill system and a Ground Bolt, the Overfill Control and ST-47C outputs will go permissive with green light ON and red light OFF.

CAUTION: BEFORE PERFORMING ANY MAINTENANCE ON THE CONTROL UNIT, DISCONNECT POWER TO THE ST-47C AND WAIT FIVE MINUTES BEFORE OPENING THE ENCLOSURE. DO NOT OPEN WHEN AN EXPLOSIVE GAS IS PRESENT.

3.1 Enclosure

Inspect the enclosure routinely for deterioration due to environmental corrosion. The control unit should be opened once per year for internal inspection and replacement of the corrosion inhibitor capsule. Repair or replace as necessary only hardware that appears cracked, broken, corroded or otherwise deteriorated. Cover screws must be minimum grade A2 – 70 stainless steel.

3.2 Corrosion Protection

The control unit is shipped from the factory with a corrosion inhibitor capsule adhered to the inside of the cover. The corrosion capsule is designed to condition the atmosphere within the enclosure to resist corrosion. It is intended to last approximately 1 year in normal use. As previously mentioned, the control unit should be opened once per year for internal inspection. At this time the corrosion capsule should be replaced (see Replacement Parts Sheet in Appendix Section 4). It is also recommended to replace the cover O-ring at the same time.

3.3 Control Module (Circuit Board)

The ST-47C control unit's internal circuitry does not require any routine periodic maintenance, but should be inspected during routine maintenance for corrosion or other signs of damage. The control circuitry may be repaired only by replacing the internal control module with an equivalent module. The internal module is non-repairable.

DO NOT ATTEMPT TO SERVICE OR REPLACE COMPONENTS ON THE ST-47C MODULE. DOING SO WILL NEGATE WARRANTIES, CERTIFICATIONS AND JEOPARDIZE INTRINSIC SAFETY ASPECTS OF THE DEVICE.

If it is determined (after troubleshooting, see Section 3.8) that control module needs to be replaced, remove the faulty control module and install the replacement control module per the following steps: (See Figure 1 ST-47C Control Module Illustration on following page). Non-operational control modules may be returned to Scully for repair. Contact Scully Technical Services for assistance in obtaining a Return Material Authorization (RMA) before returning any material to the factory.

3.4 Module Replacement

REMOVING THE MODULE

1. Remove (disconnect) power from the ST-47C Control Unit. Make sure the work area is gas vapour free.
2. To open the ST-47C Control Unit cover, remove the (16) hex socket head bolts by using a 6mm hex wrench.
3. Mark/label wires connected to TB1 on printed circuit board (to be able to reconnect to the same terminal numbers on the replacement module).
4. Disconnect all wires connected to TB1.
5. Mark/label wires connected to TB2.
6. Disconnect all wires connected to TB2.
7. Remove the Control Module assembly by loosening the four-(4) mounting screws located in the four corners of the Control Module assembly.

INSTALLING REPLACEMENT MODULE

1. Place the new Control Module onto the mounting plate and attach the (4) mounting screws.
2. Reconnect the wires to TB2.
3. Reconnect the wires to TB1.
4. Close the cover and attach the (16) cover bolts. Ensure the bolts are evenly tightened.
5. Apply power to the Control Unit and test for proper operation.

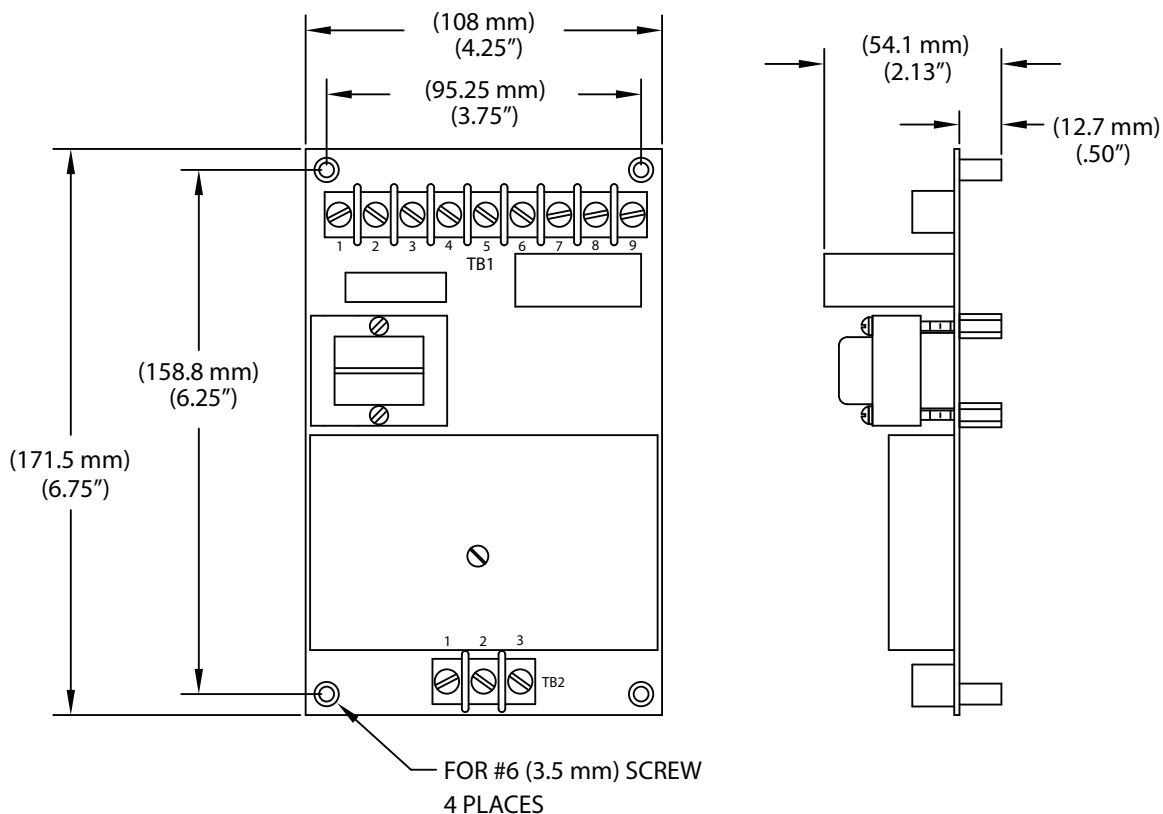


Figure 1: ST-47C Control Module Illustration

Note: The ST-47C Replacement Control Module cannot be repaired in the field. A damaged or faulty module must be replaced with an equivalent Scully ST-47C Control Module. The ST-47C Replacement Control Module must only be installed in Scully's explosion-proof enclosure. The enclosures' explosion-proof and weatherproof integrity must be maintained.

Caution: Do not expose the Control Module to aggressive substances that may attack the exposed material.

When used properly, contact with the control module will not cause physical injury or harm and does not pose non-electrical dangers. The unit does not produce excessive surface temperatures, or emit infrared electromagnetic or ionizing radiation.

3.5 Indicator Lights

The control unit employs explosion-proof LED style lights. These do not require any maintenance or changing of bulbs. In the event a light is faulty, it must only be replaced with parts numbers shown in Replacement Parts Sheet in Appendix 4. Follow instructions provided with the replacement indicator lights (pilot lights).

Note: Older ST-47C Controllers employed incandescent style lights. These require replacement of bulb if it blows. Refer to Replacement Parts Sheet in Appendix 4. Switch off AC power supply to the controller before replacing a bulb.

3.6 Control (Bypass) Switch

On those models having a lockable control (Bypass) switch the switch box may be replaced, by removing two screws inside the switch box. The switch box is replaced as a unit.

A faulty switch may also be replaced if necessary, see Replacement Parts Sheet in Appendix 4 for replacement part numbers.

3.7 Junction Box and Plug & Cable Unit

The Sculcon Junction Box and Cable unit requires simple routine maintenance. More attention is needed in highly corrosive environments.

Although it is not required, we recommend that the exposed electrical contact of the plug be coated with a corrosion inhibiting film routinely (once per month is suggested). Corrosion inhibiting spray, ACF-50 Corrosion Block® (manufactured by Lear Chemical Research Corporation, Mississauga ON Canada www.learchem.com). Other external metal parts of these accessories may also be treated as necessary to prevent atmospheric corrosion problems.

The exterior surface of the plug should be kept clean using a mild detergent based cleaning solution and water. The cabling should be routinely wiped of foreign material and cleaned to preserve the outer jacket. To protect it from loading arm damage etc., it is important to store the plug and cable out of harms way when it is not in use. A hook is provided on Sculcon Junction Box or, if an overfill prevention plug is used, a Scully Storage Socket may be used.

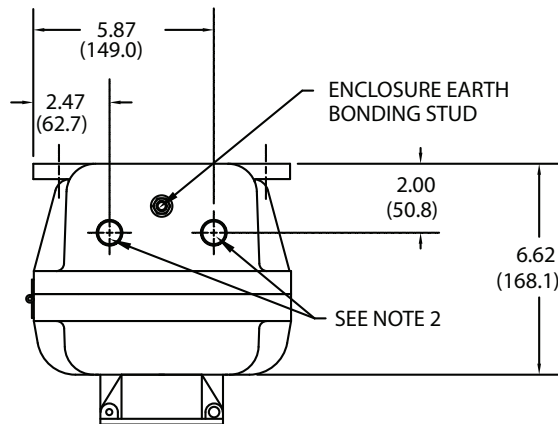
3.8 Troubleshooting

The following troubleshooting guide should aid in an initial diagnosis of most problems encountered with installation and operation of ST-47C.

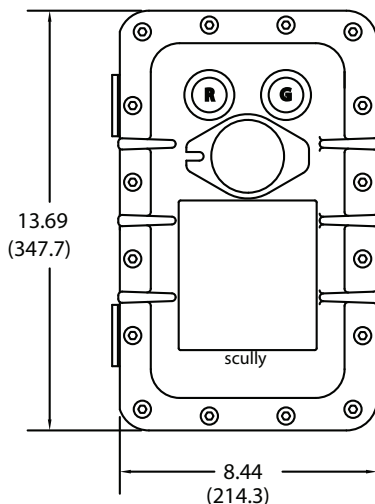
Condition	Possible Cause
No lights ON, on front cover	- No power to control unit - Control (Bypass) Switch in OFF position - Bulb blown (on older units with incandescent lamps) - Input power fuse (F1) is blown - Control Module is defective - Bad wiring to lamps
Green (Permissive) light ON, but control contact output does not activate valve/pump	- Control Output fuse (F2) is blown - Wiring defect (control output contact wiring) - Control Module is defective
Red (Non-permissive) light stays ON when connected to vehicle equipped with Ground Ball (or Ground Bolt)	- Fault in wiring to junction box and/or plug - Ground Ball (or Ground Bolt) not installed properly on vehicle. - Bad plug to Ground Ball or Ground Bolt socket connection - Control Module is defective - Incorrect wiring to ST-47C TB2

4.1 DWG 31412 – Outline Drawing – Control Unit Enclosure

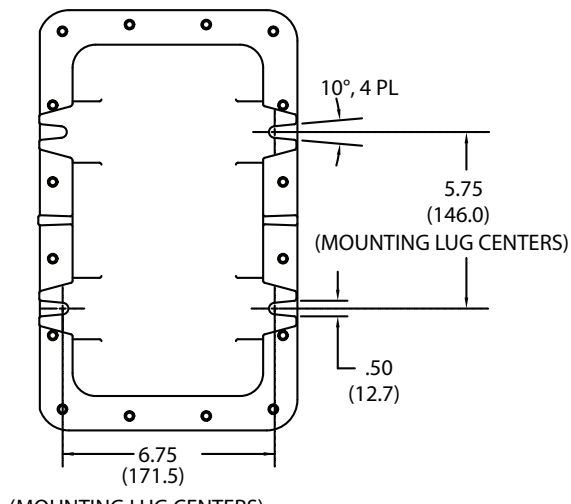
31412 RevC



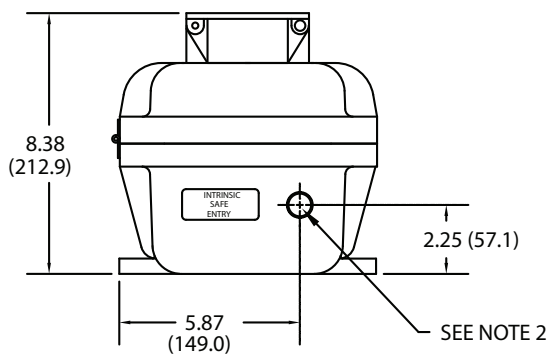
TOP VIEW



FRONT VIEW



REAR VIEW

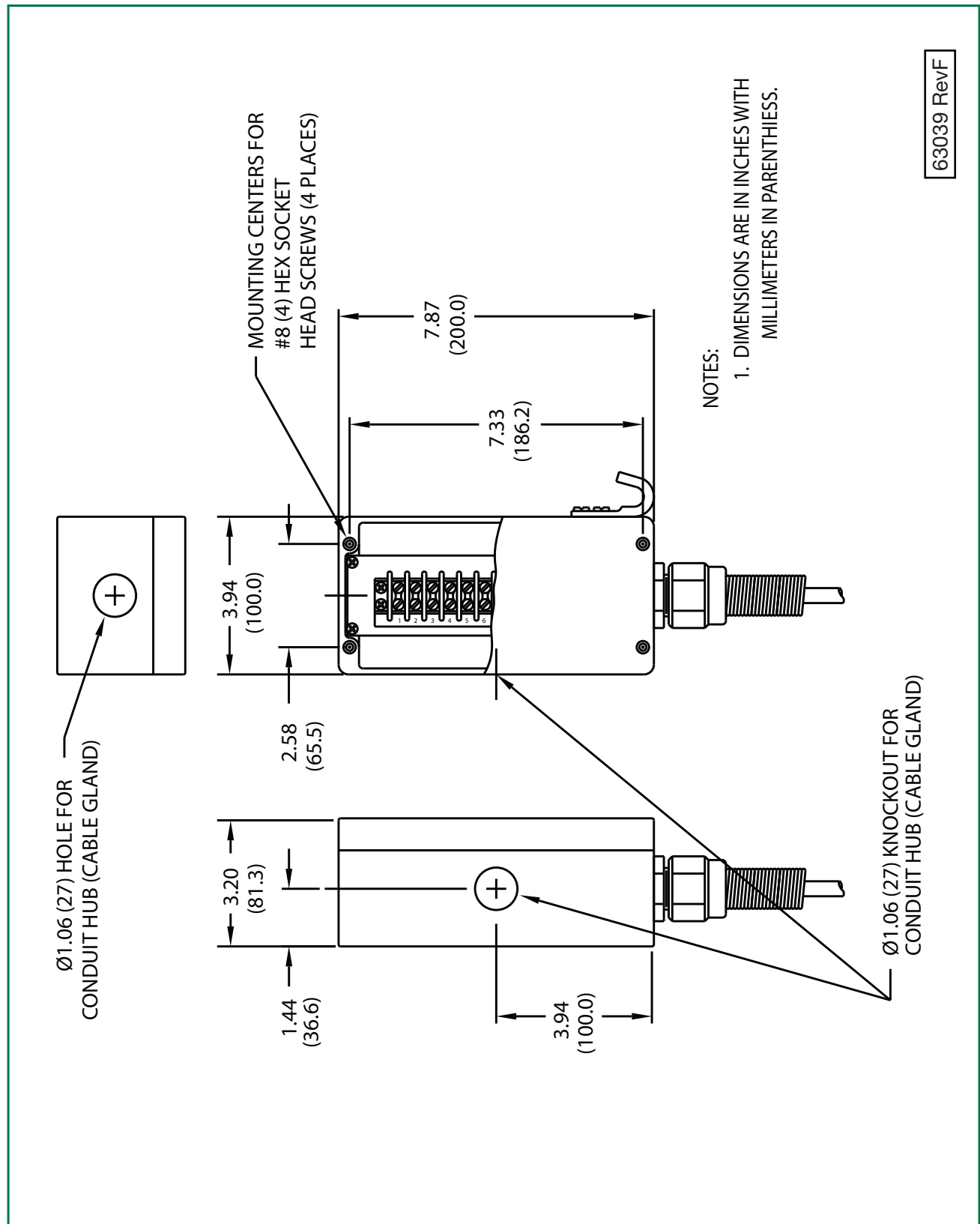


BOTTOM VIEW

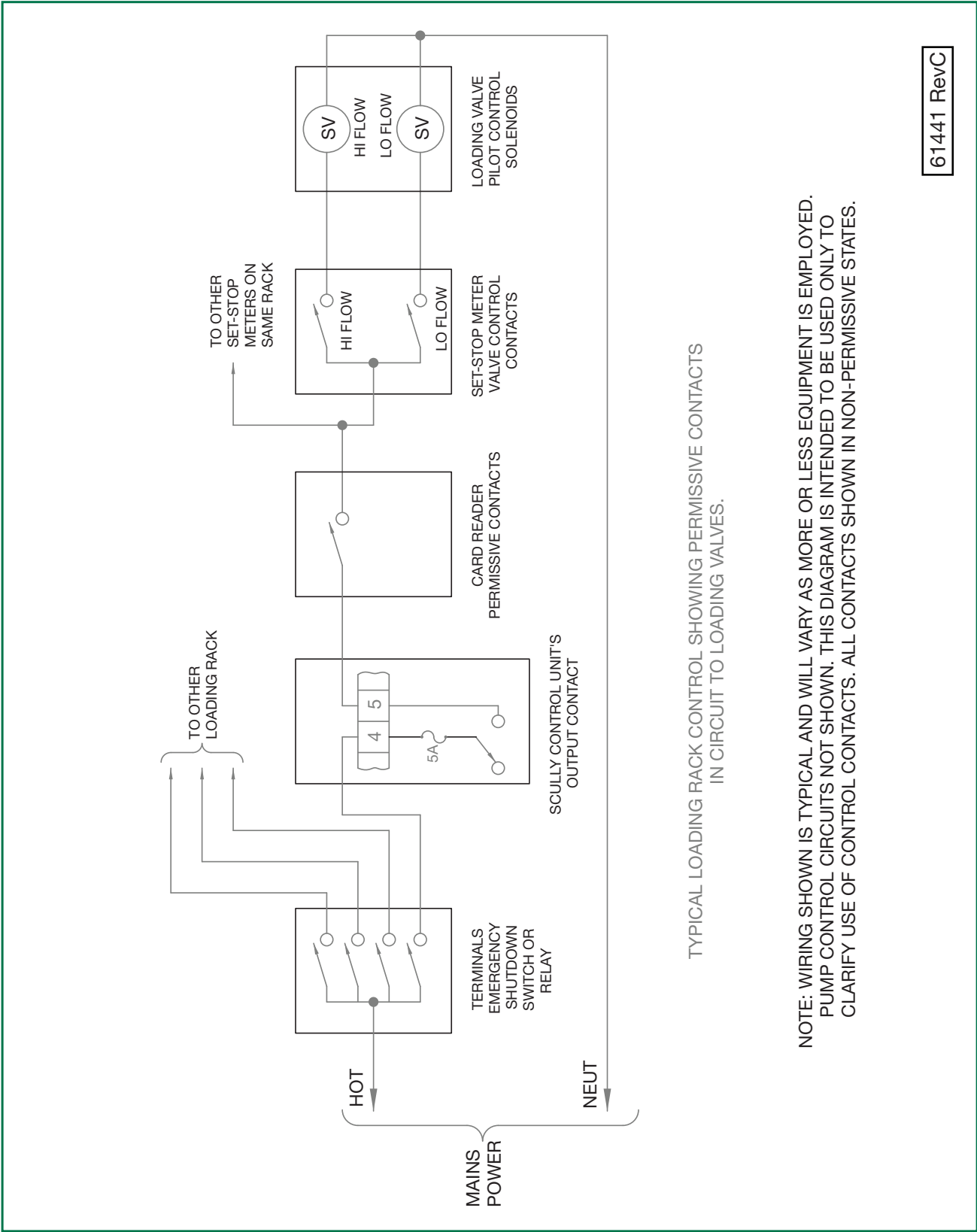
NOTES:

1. DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN PARENTHIESS.
2. ENTRY HOLES:
FMC APPROVED MODELS: 3/4" NPT
ATEX APPROVED MODELS: M20 X 1.5

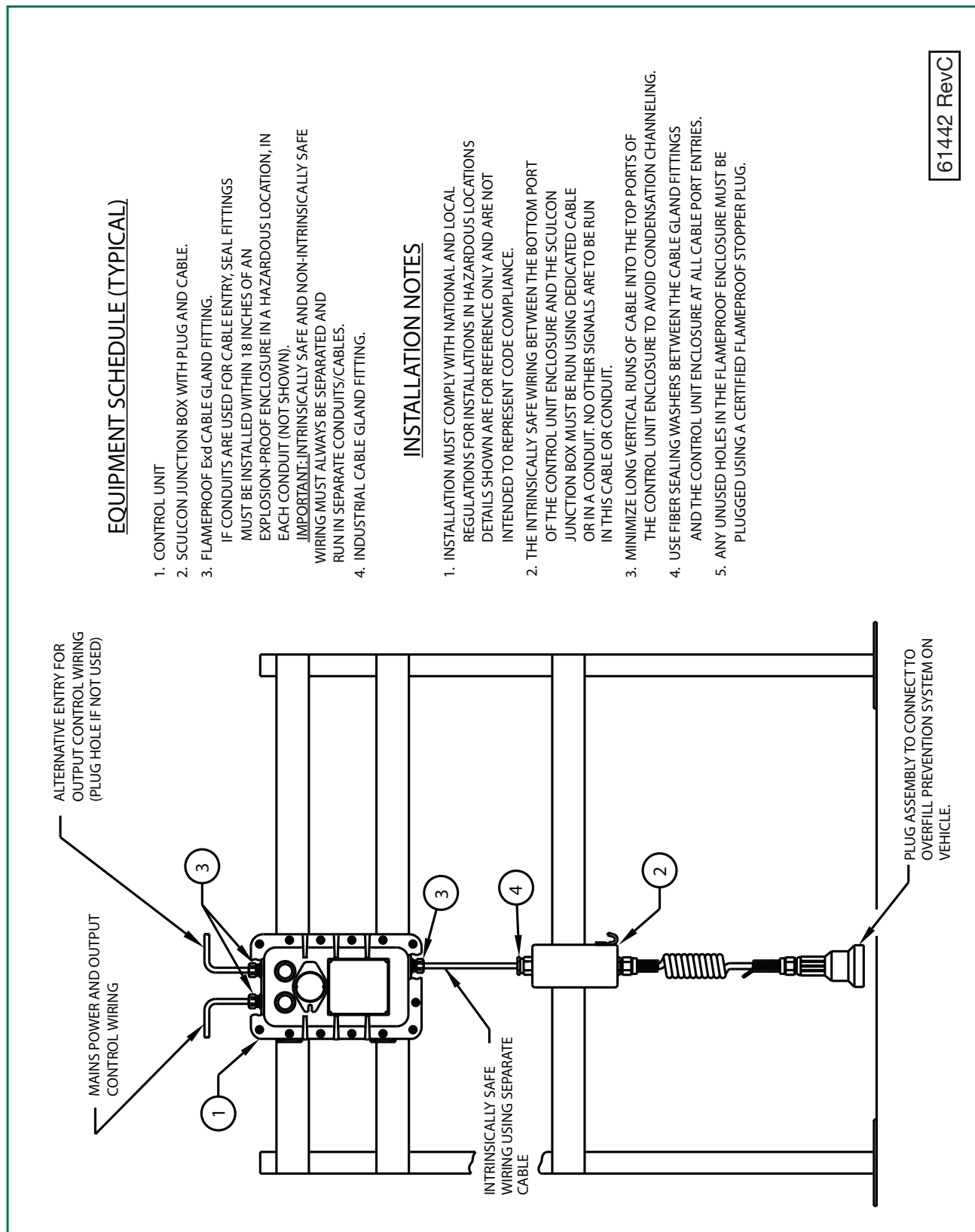
4.2 DWG 63039 – Outline Drawing – Sculcon Junction Box



4.3 DWG 61441 – Wiring Diagram – Typical Loading Rack Control



4.4 DWG 61442 – Mounting Diagram – Control Unit & Junction Box



4.5 DWG 61408 – Internal Wiring Diagram - ST-47C-EL

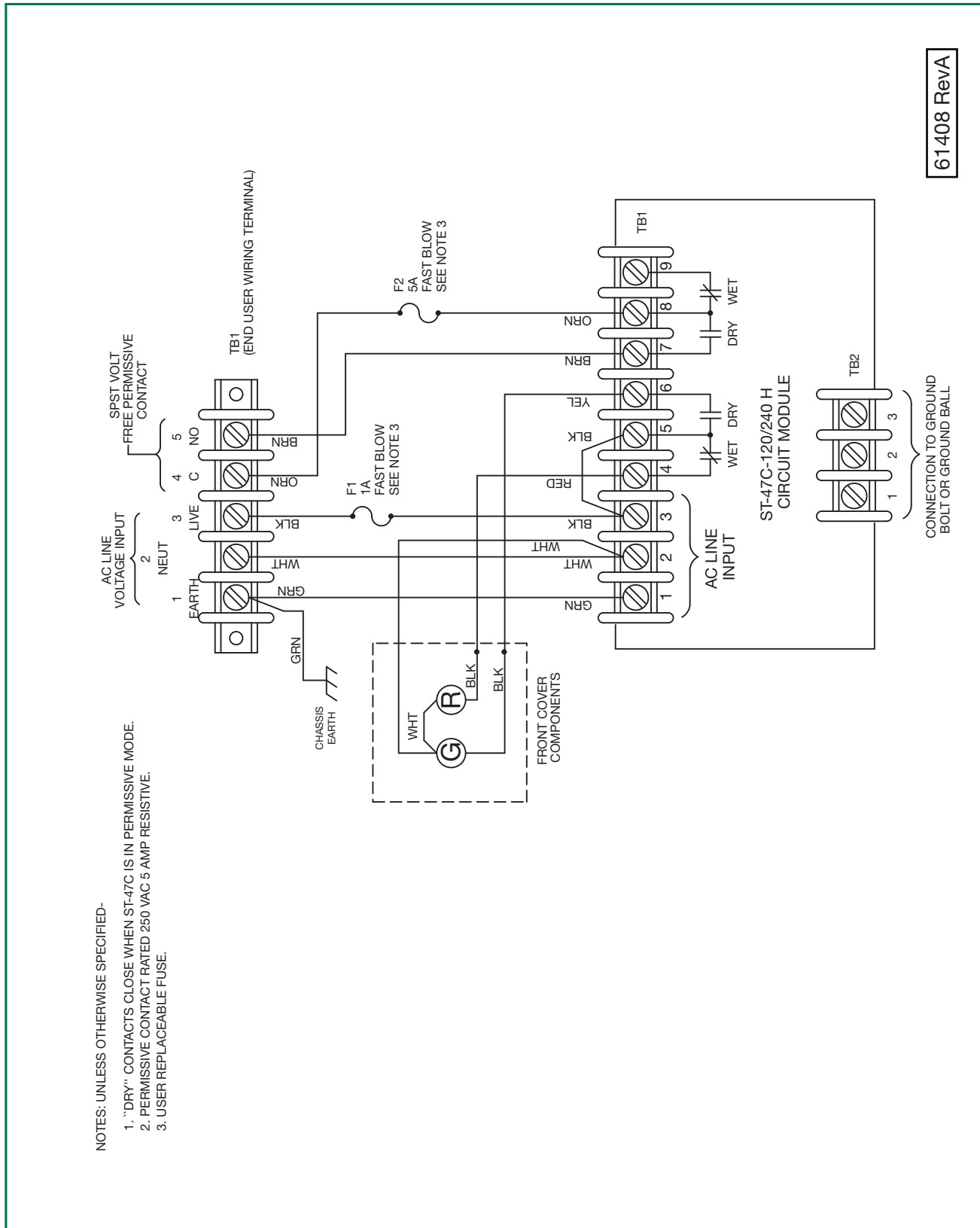
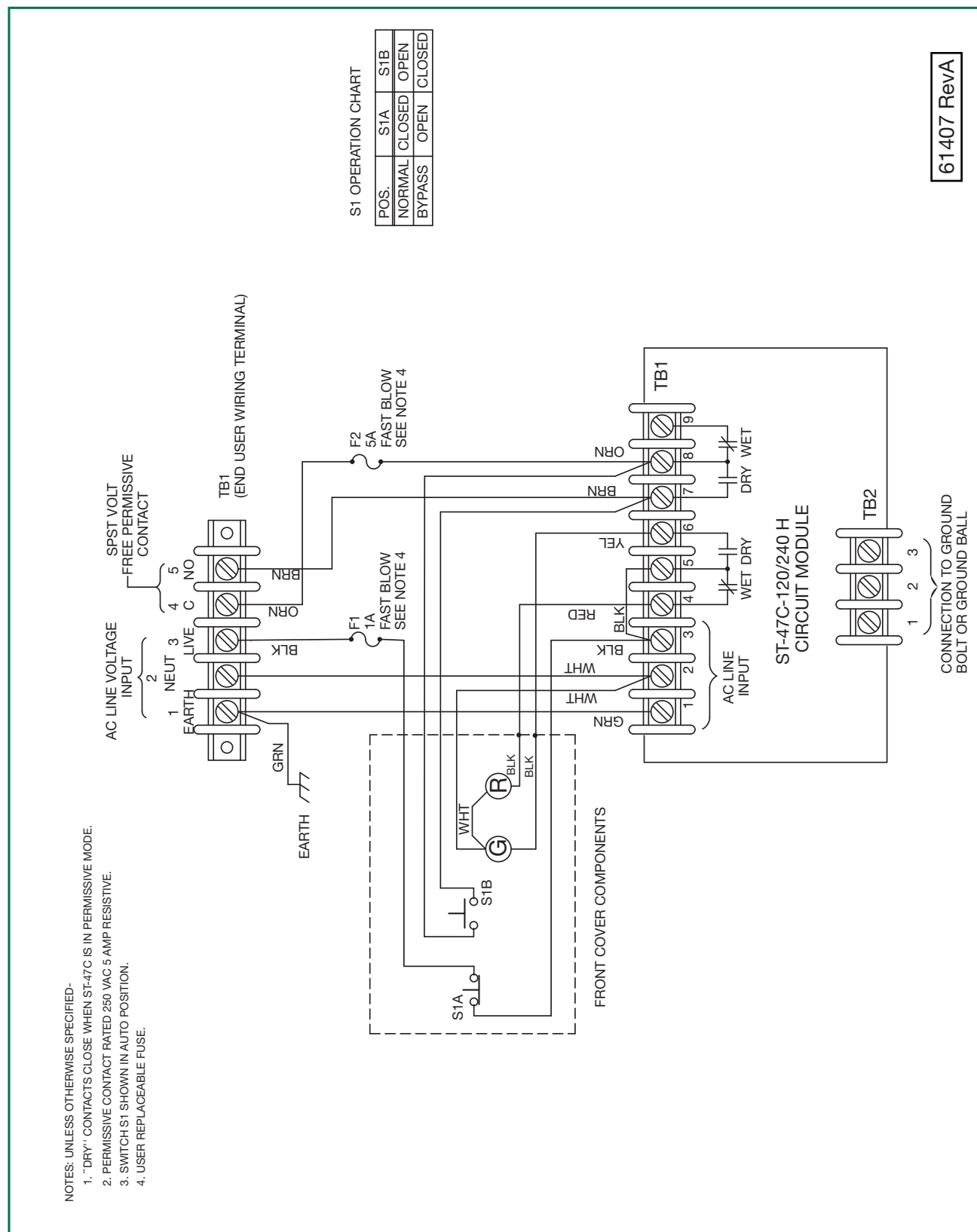


Diagram Appendix

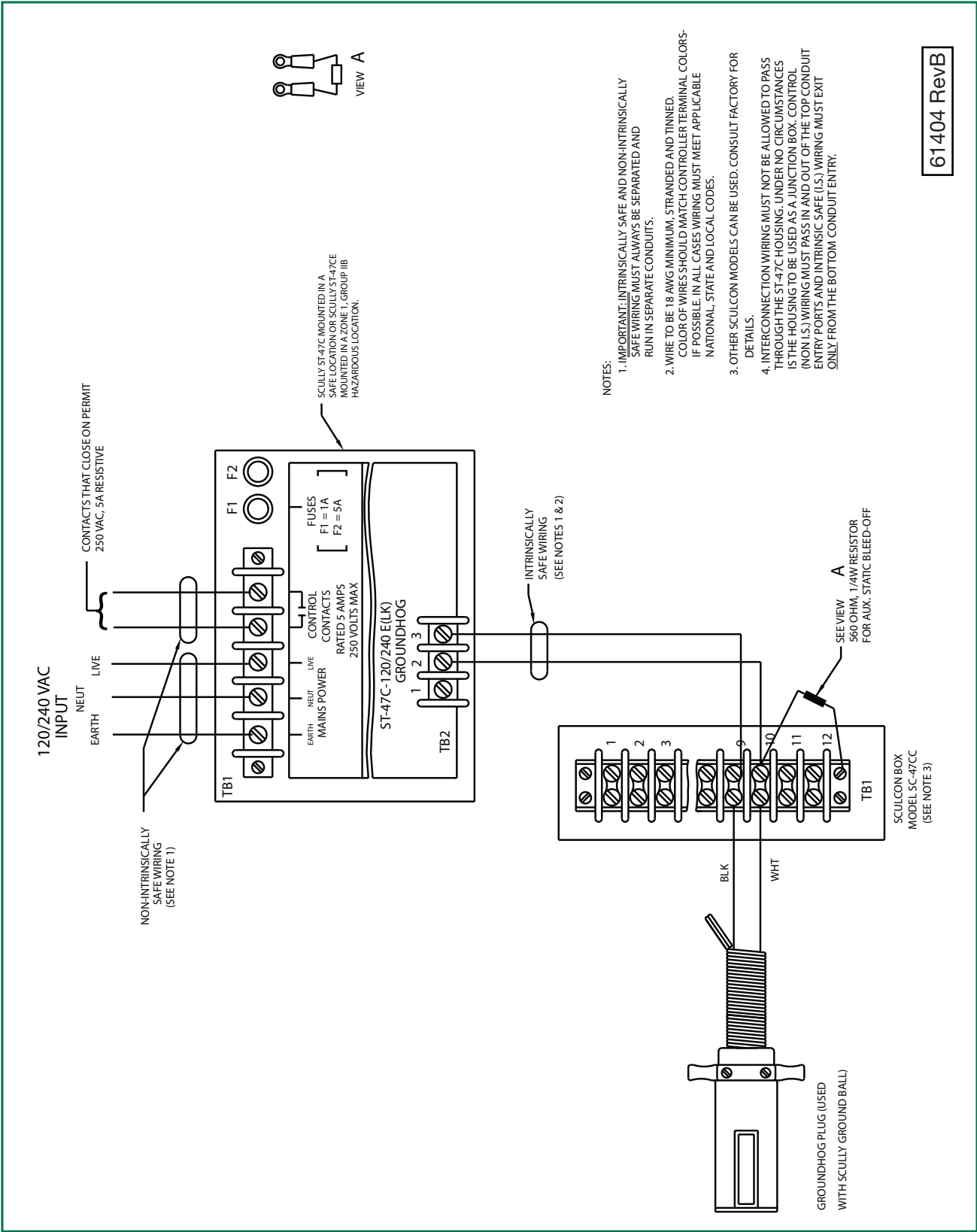
4.6 DWG 61407 – Internal Wiring Diagram - ST-47C-ELK



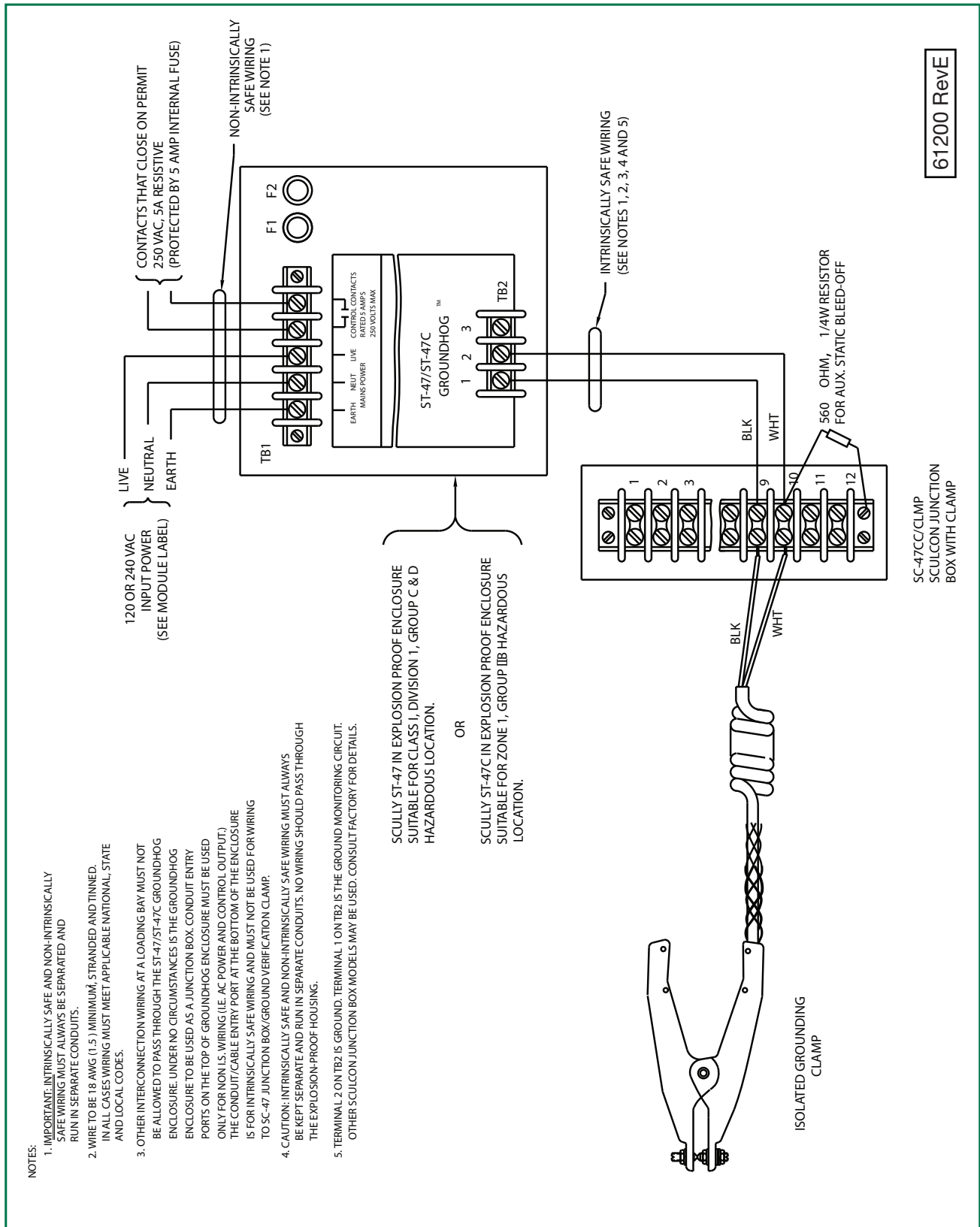
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Diagram Appendix

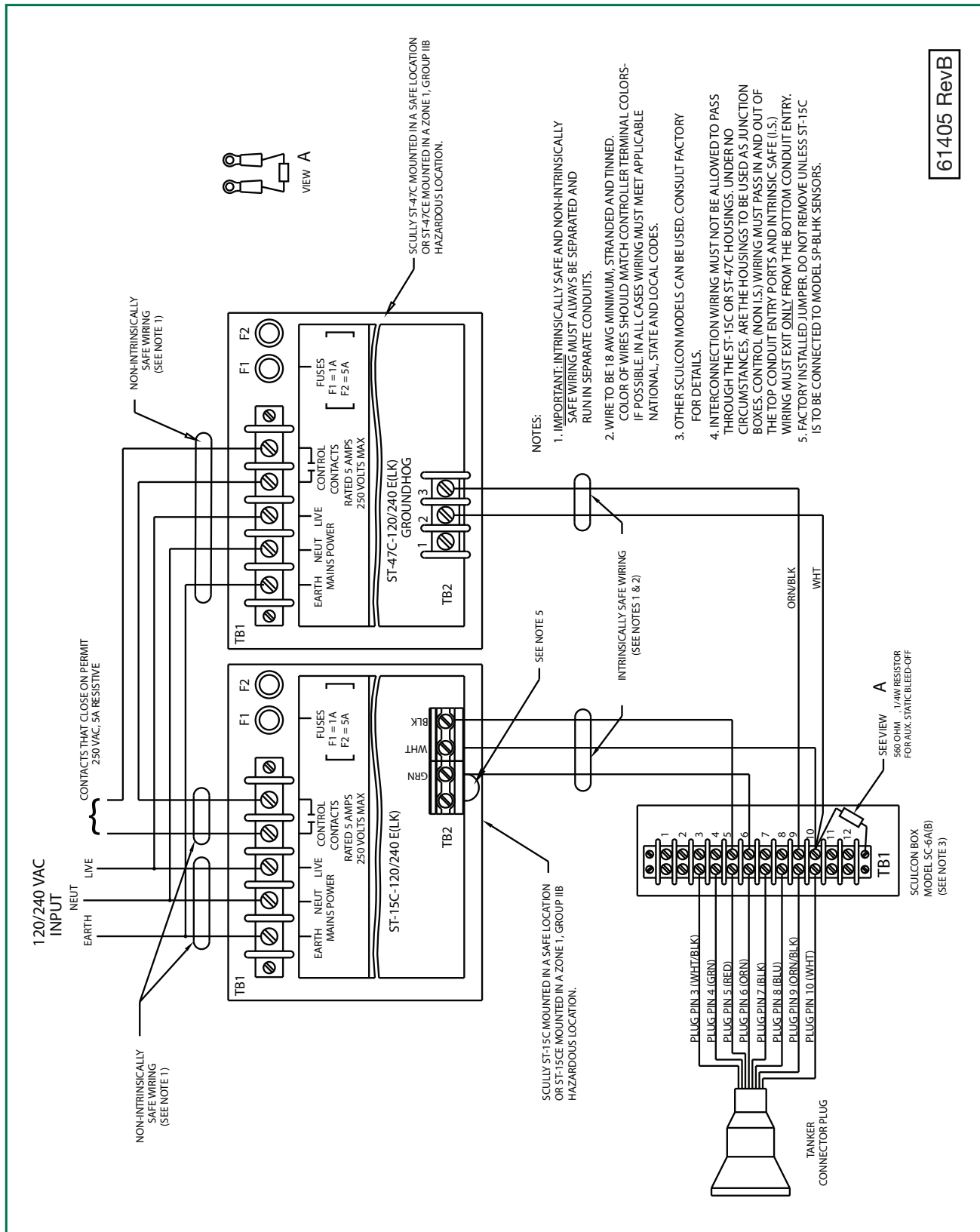
4.7 DWG 61404 – Installation Wiring Diagram, ST-47C w/ SC-47 Plug



4.8 DWG 61200 – Installation Wiring Diagram, ST-47C w/ SC-47 Clamp

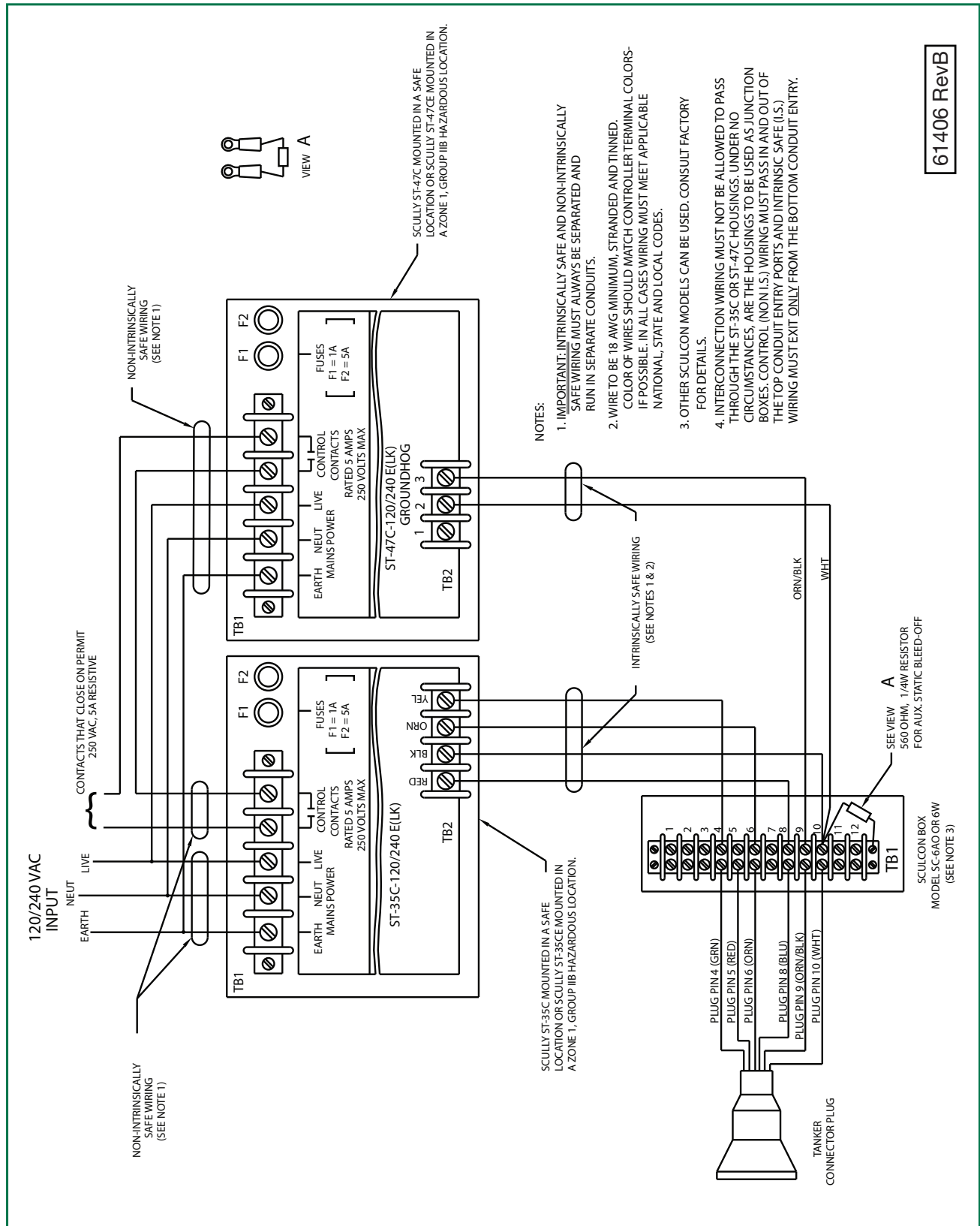


4.9 DWG 61405 – Installation Wiring Diagram, ST-15C/ST-47C



61405 RevB

4.10 DWG 61406 – Installation Wiring Diagram, ST-35C/ST-47C



61406 RevB

4.11 DWG 61557 – Replacement Parts ST-47C-120

REPLACEMENT PARTS for ST-47C 120VAC

ST-47C 120VAC

Groundhog™ Vehicle Earthing Controller
ATEX Models

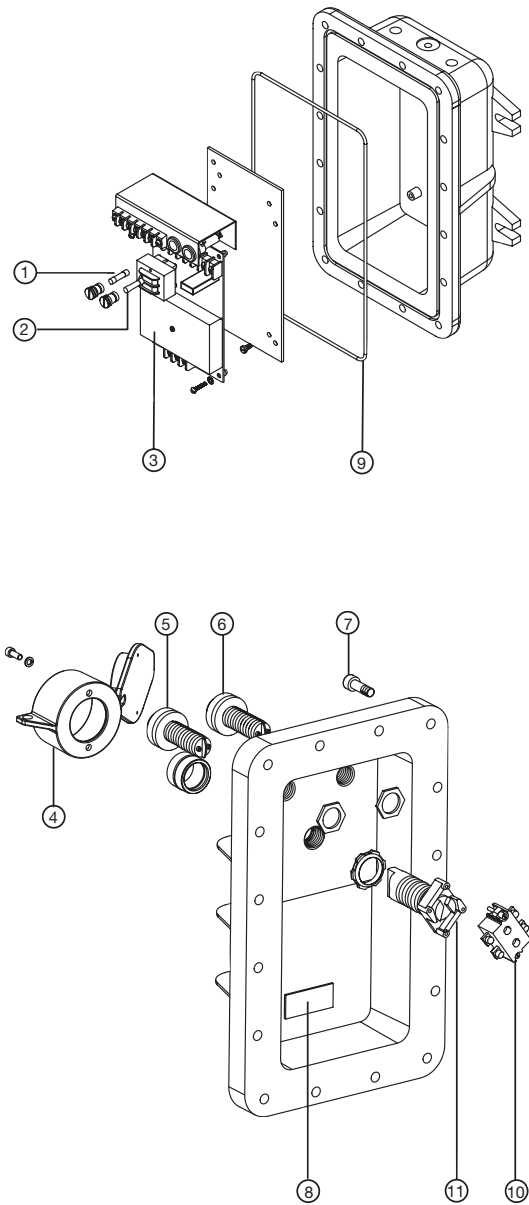
Part No.	Model
08844	ST-47C-120 EL
08845	ST-47C-120 ELK

Note: Controller Models Suffix::
Explosion-proof housing (E), Indicator Lights (L), Key (K) Lockable
Bypass Switch.

Replacement Parts

Item	Part No.	Description	Qty.
1	26343	Main Fuse, 1 Ampere	1
2	26350	Control Fuse, 5 Ampere	1
3	09511	ST-47C-120 Replacement Module	1
4	08350	Bypass Switch Lockbox (includes 2 mounting screws)	1
5	09220	Replacement Light Explosion Proof Lamp Assembly, Green, LED Style	1
6	09221	Replacement Light Explosion Proof Lamp Assembly, Red LED Style	1
7	50005	Socket Head Cap Screw, Stainles	16
8	21733	Corrosion Capsule	1
9	31340	O-ring cover seal	1
10	26022	Bypass Switch Contact Block	1
11	26093	Bypass Switch Operator 2 Position	1
*	27085	Bulb, 120V, 6W*	

Notes:
Item 7: New socket head screw used on models built after 10/92.
Item 9: O-ring used on models built after 10/92.
Item 5, 6: LED style lamps used on models built after 10/04/01.
* Replacement bulb for incandescent style explosion-proof lights only.
Use on models built prior to 10/04/01.



4.12 DWG 61274 – Replacement Parts ST-47C-240

REPLACEMENT PARTS for ST-47C 240VAC

ST-47C 240VAC

Groundhog™ Vehicle Earthing Controller
ATEX Models

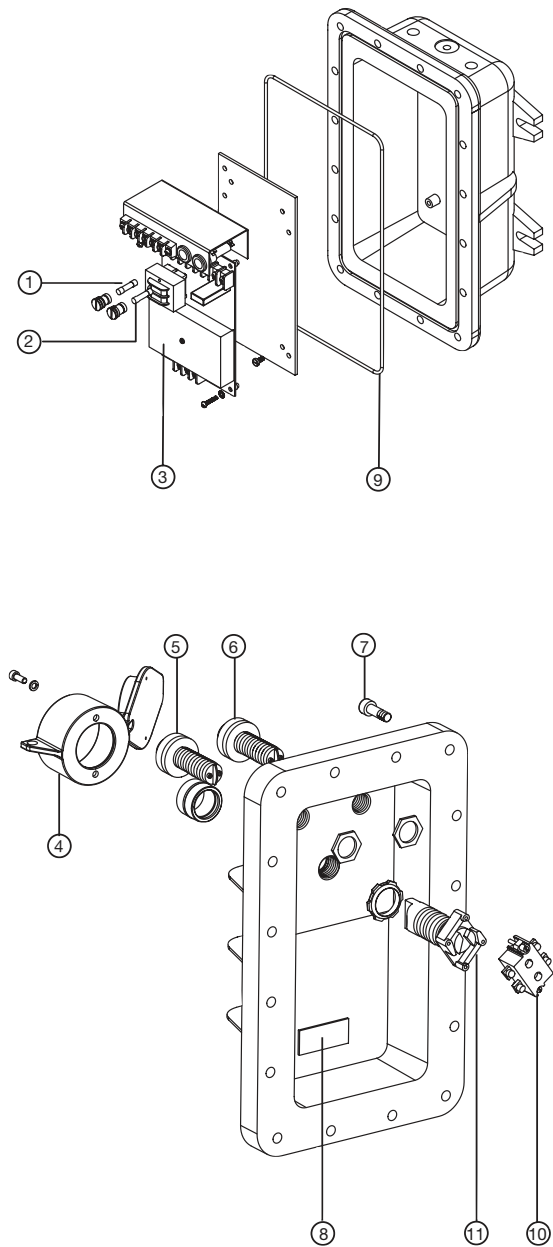
Part No.	Model
08710	ST-47C-240 EL
08711	ST-47C-240 ELK

Note: Controller Models Suffix:
Explosion-proof housing (E), Indicator Lights (L), Key (K) Lockable
Bypass Switch.

Replacement Parts

Item	Part No.	Description	Qty.
1	26343	Main Fuse, 1 Ampere	1
2	26350	Control Fuse, 5 Ampere	1
3	09512	ST-47C-240 Replacement Module	1
4	08350	Bypass Switch Lockbox (includes 2 mounting screws)	1
5	09420	Replacement Light Explosion Proof Lamp Assembly, Green, LED Style	1
6	09421	Replacement Light Explosion Proof Lamp Assembly, Red LED Style	1
7	50005	Socket Head Cap Screw, Stainles	16
8	21733	Corrosion Capsule	1
9	31340	O-ring cover seal	1
10	26022	Bypass Switch Contact Block	1
11	26093	Bypass Switch Operator, 2 Position	1
*	27065	Bulb, 240V, 6W*	

Notes:
Item 7: New socket head screw used on models built after 10/92.
Item 9: O-ring used on models built after 10/92.
Item 5, 6: LED style lights used on models built after 8/01
* Replacement bulb for incandescent style explosion-proof lights only.
Use on models built prior to 8/01.



Certificate Number
Baseefa17ATEX0088U
Issue 2

SGS

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1

EU - TYPE EXAMINATION CERTIFICATE

2

**Component Intended for use on/in an Equipment or Protective System
Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU**

3

EU - Type Examination Certificate Number: **Baseefa17ATEX0088U – Issue 2**

4

Product: **ST-47C, ST-46C Series Control Module**

5

Manufacturer: **Scully Signal Company**

6

Address: **70 Industrial Way, Wilmington, Massachusetts 01887-0588,
United States of America**

7

This re-issued certificate extends EC Type Examination Certificate No. **Baseefa17ATEX0088U** to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8

SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that the product, as modified by this supplementary certificate, has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

8.1

The original certificate was issued by SGS Baseefa Ltd (UK Notified Body 1180). It, and any supplements previously issued by SGS Baseefa Ltd have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.

The examination and test results are recorded in confidential Report No. **See certificate history**

9

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018 EN IEC 60079-11: 2024

except in respect of those requirements listed at item 18 of the Schedule.

10

The sign “U” is placed after the certificate number. It indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

11

This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12

The marking of the product shall include the following:

Ⓔ II (1) G [Ex ia Ga] IIC (-40°C ≤ T_{amb} ≤ +70°C)

SGS Baseefa Customer Reference No. **0951**

Project File No. **25/0534**

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Group (SGS SA)

FINAS
Finnish Accreditation Service
S003 (EN ISO/IEC 17065)



Mikko Välimäki
SGS Fimko Oy

Certificate Number
Baseefa17ATEX0088U
Issue 2



Issued 19 December 2025
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Schedule

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Certificate Number Baseefa17ATEX0088U – Issue 2

15 Description of Product

The ST-47C Component Module is designed to ensure a satisfactory ground contact between a terminal loading rack, and a tank or tank vehicle which is in the process of loading or unloading hazardous liquid. In the event of a good ground connection being lost, the module energises an integral electro-mechanical relay that has volts free contacts available to the user.

The product line also includes the ST-46C, a variant of the ST-47C that is functionally and electronically identical. While used in a slightly different application. As part of the Scully Vapor Connect System, the ST-46C monitors the vapor recovery hose connection during loading and automatically shuts down operations if the hose disconnects. It uses a proprietary signal from a proximity sensor in the vapor coupler, ensuring secure operation and preventing unauthorized overrides. Loading can only begin once a valid connection signal is received.

The module comprises a printed circuit board containing a mains voltage energised d.c. power supply, an electronic circuit, an electromechanical output relay and terminals for external connections. The relay contacts are rated at 250V a.c., 5A resistive load.

The ST-46C and ST-47C Series comprises models ST-47C-120 / ST-46C-120 and ST-47C-240 / ST-46C-240. Models ST-47C-120 / ST-46C-120 are fitted with a transformer suitable for 120V mains input and Models ST-47C-240 / ST-46C-240 are fitted with a transformer suitable for 240V mains input.

ST-47C-120 / ST-46C-120 Safe Area Terminals - TB1 Terminals 2 to 9

$$U_m = 127V_{rms}$$

The ST-47C-120 / ST-46C-120 are designed to operate from an a.c. supply voltage of nominally 120V. The relay contacts are rated at 5A.

ST-47C-240 / ST-46C-240 Safe Area Terminals - TB1 Terminals 2 to 9

$$U_m = 253V_{rms}$$

The ST-47C-240 / ST-46C-240 are designed to operate from an a.c. supply voltage of nominally 240V. The relay contacts are rated at 5A.

Intrinsically Safe Terminals - TB2

$$U_o = 58V$$

$$I_o = 16mA$$

$$P_o = 120.7mW$$

C_o refer to the table below

L_o refer to the table below

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR L/R RATIO ($\mu H/\Omega$)
IIC	0.03	147	218
IIB	0.23	590	872
IIA	0.8	1180	1745

Certificate Number
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Issue 2



Issued 19 December 2025
Page 3 of 4

The parameters in the table above apply when one of the two conditions below is given:

- the total L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value or
- the total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.

The parameters in the table above are reduced to 50% when both of the two conditions below are given:

- the total L_i of the external circuit (excluding the cable) $\geq 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of C_i plus cable capacitances respectively.

16 Report Number

See certificate history.

17 Schedule of Limitations

1. The module must be installed in an enclosure which provides a degree of protection of at least IP20. The degree of protection provided must be suitable for the intended use.
2. The intrinsically safe wiring to the module must be adequately segregated from the non-intrinsically safe wiring.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
D33582	1 of 1	G	10/29/25	PCB Assembly, ST-47C
31514APP	1 of 1	A	10/30/25	Label, ST-46C / 47C Module
D33581	1 & 2	F	7/10/25	PCB, ST-47C

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
D33580	1 of 1	A	12/7/15	Schematic, ST-47 / ST-47C-240
33582	1 to 3	C	12/1/2017	Single Level Current BOM Report, S PCB Assy, ST-47C-240
33584	1 to 3	C	12/1/2017	Single Level Current BOM Report, S PCB Assy, ST-47C-120
D33583	1 of 1	A	12/7/15	Schematic, ST-47 / ST-47C-120
D25735	1 of 1	H	7/6/15	Transformer, Split-Tran, 240V, 4174/183T, 104°C
D31859	1 of 1	F	7/6/15	Transformer, Split-Tran, 120V, 2087/183T, 104°C

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Number	Sheet	Issue	Date	Description
D25515	1 of 1	C	8/29/00	Relay, Hengstler/Haller 24V sealed
D25554	1 of 1	A	8/31/00	Relay, Assy, Hengstler/Haller 12V sealed
25554	1 of 1	B	10/8/2015	Single Level Current BOM, S Rly Assy, 12V Sealed
D26422	1 of 1	B	7/6/17	Fuse, Axial, Fast, 50mA
D26423	1 of 1	B	7/6/17	Fuse, Axial, Fast, 200mA

Note - Document numbers prefixed with a "D" are drawings, the "D" is not present in the drawing number box on the drawing. These drawings are associated, and held, with IECEx BAS 17.0071U Iss. 0.

20 Certificate History

Certificate No.	Date	Comments
Baseefa17ATEX0088U	27 February 2018	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0:2012+A11:2013 and EN 60079-11:2012 is recorded in the IECEx ExTR GB/BAS/ExTR17.0246/00 and held with Project File 16/0271
Baseefa17ATEX0088U Issue 1	5 February 2024	This issue of the certificate confirms the current design meets the requirements of EN IEC 60079-0: 2018 including the revision of the equipment marking in accordance with these standards. The test and assessment is recorded in the IECEx ExTR GB/BAS/ExTR24.0016/00 and held with Project File 23/0566.
Baseefa17ATEX0088U Issue 2	19 December 2025	To confirm that the current design meets the requirements of EN IEC 60079-11: 2024. To include the ST-46C series model. The associated test and assessment is documented in Test Report No. GB/SGS/ExTR25.0159/00. Project File No. 25/0534.
For drawings applicable to each issue, see original of that issue.		

Certificate Number
Baseefa17ATEX0158X
Issue 2



Issued 19 December 2025
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- 1 EU - TYPE EXAMINATION CERTIFICATE**
- 2 Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU**
- 3** EU - Type Examination Certificate Number: **Baseefa17ATEX0158X – Issue 2**
- 4** Product: **Type ST-47C Groundhog Unit and ST-46C Vapor Connect System**
- 5** Manufacturer: **Scully Signal Company**
- 6** Address: **70 Industrial Way, Wilmington, Massachusetts 01887-0588, USA**
- 7** This re-issued certificate extends EU Type Examination Certificate No. Baseefa17ATEX0158X to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.
- 8** SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- 8.1** The original certificate was issued by SGS Baseefa Ltd (UK Notified Body 1180). It, and any supplements previously issued by SGS Baseefa Ltd have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.
- The examination and test results are recorded in confidential Report No. See certificate history.
- 9** Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
IEC EN 60079-0: 2018 EN 60079-1: 2014 EN IEC 60079-11: 2024 EN 60079-18: 2015
except in respect of those requirements listed at item 18 of the Schedule.
- 10** If the sign “X” is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.
- 11** This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- 12** The marking of the product shall include the following :
- Ⓔ II 2(1) G Ex db [ia Ga] mb IIB T5 Gb (T_{amb} = -40°C to 60°C)**

SGS Fimko Oy Customer Reference No. **0951**

Project File No. **25/0534**

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Mikko Välimäki
SGS Fimko Oy

Certificate Number
Baseefa17ATEX0158X
Issue 2



Issued 19 December 2025
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Schedule

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Certificate Number Baseefa17ATEX0158X – Issue 2

15 Description of Product

The Type ST-47C Groundhog Unit continuously monitors the earthing connection during loading operations. The control unit with the internal, component certified, electronic module and defined, component operators, together with associated probes as detailed below, provide automatic shut down when the earth connection is broken during the loading process.

The product line also includes the ST-46C, a variant of the ST-47C that is functionally and electronically identical. While used in a slightly different application. As part of the Scully Vapor Connect System, the ST-46C monitors the vapor recovery hose connection during loading and automatically shuts down operations if the hose disconnects. It uses a proprietary signal from a proximity sensor in the vapor coupler, ensuring secure operation and preventing unauthorized overrides. Loading can only begin once a valid connection signal is received.

ST-47C and ST-46C are rated 250 Va.c, 5 A.

Both units comprise a cast aluminium housing with a flanged cover attached using 16 stainless steel socket head screws of grade A2-70. The cover may be fitted with up to two signal lamps to TRAC 12 ATEX 0033U coded Ex d mb IIC Gb, Ex mb tb IIIC Db and a flameproof operator switch to DEMKO 15 ATEX 1575U coded Ex db IIC Gb.

The enclosure base contains certified intrinsically safe control module as detailed below: -

ST-47C to Baseefa17ATEX0088U coded [Ex ia Ga] IIB ($T_{amb} = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$) with the following input/output parameters:

ST-47C-120 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 127\text{Vrms}$

The ST-47C-120 is designed to operate from an a.c. supply voltage of nominally 120V. The relay contacts are rated at 5A.

ST-47C-240 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 253\text{Vrms}$

The ST-47C-240 is designed to operate from an a.c. supply voltage of nominally 240V. The relay contacts are rated at 5A.

Intrinsically Safe Terminals - TB2

$U_o = 58\text{V}$

$I_o = 16\text{mA}$

$P_o = 120.7\text{mW}$

C_o refer to the table below

L_o refer to the table below

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu\text{H}/\text{ohm}$)
IIC	0.03	147		218
IIB	0.23	590		872
IIA	0.8	1180		1745

The parameters in the table above apply when one of the two conditions below is given:

- The total L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value or
- The total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.

The parameters in the table above are reduced to 50% when both of the two conditions below are given:

- The total L_i of the external circuit (excluding the cable) $\geq 1\%$ of the L_o value and
- The total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of C_i plus cable capacitances respectively.

Certificate Number
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Issued 19 December 2025
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16 Report Number

See Certificate History.

17 Specific Conditions of Use

1. Flamepaths must not be repaired.
2. Wipe with damp cloth to reduce the potential for electro-static discharge. See instructions

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.6.1	Manual Override to ensure safety of systems
1.6.3	Hazards from Power Failure

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
32746APP	1 of 1	B	12/1/25	Label, "ST-46C", "ST-47C"

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
08711	1 of 3	J	3/05/2018	ST-47C-E,EL & ELK
27115	1 of 2	E	12/21/2017	Light, Pilot
26055	1 of 1	G	2/23/2018	Selector Switch Operator

20 Certificate History

Certificate No.	Date	Comments
Baseefa17ATEX0158X	13 March 2018	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0 : 2012 + A11: 2013, EN 60079-1: 2014, EN 60079-11: 2012 and EN 60079-18: 2015 is documented in Test Report No. GB/BAS/ExTR17.0371/00.
Baseefa17ATEX0158X Issue 1	9 September 2025	This issue of the certificate incorporates previously issued primary certificate into one certificate and confirms the current design meets the requirements of IEC EN 60079-0:2018, EN 60079-1: 2014, EN 60079-11:2012 and EN 60079-18: 2015+A1:2017 and following variations: -To Update the Standards to the latest edition -To include the variation TC-46C Vapor Controller -To add an 'X' suffix to the certificate numbers and Specific Conditions of Use to the certificates. -To remove IP rate from marking code SGS report GB/SGS/ExTR24.0030/00
Baseefa17ATEX0158X Issue 2	19 December 2025	To confirm that the current design meets the requirements of EN IEC 60079-11: 2024. The associated test and assessment is documented in Test Report No. GB/SGS/ExTR25.0160/00. Project File No. 25/0534.
For drawings applicable to each issue, see original of that issue.		



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC Certification System for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com

Ex COMPONENT CERTIFICATE

Certificate No.: **IECEX BAS 17.0071U**

Page 1 of 5

Certificate history:

Status: **Current**

Issue No: 2

[Issue 1 \(2024-02-06\)](#)
[Issue 0 \(2018-02-27\)](#)

Date of Issue: 2025-12-19

Applicant: **Scully Signal Company**
70 Industrial Way
Wilmington
Massachusetts
01887-0588
United States of America

Ex Component: ST-47C, ST-46C Series Control Module

This component is NOT intended to be used alone and requires additional consideration when incorporated into other equipment or systems for use in explosive atmospheres (refer to IEC 60079-0).

Type of Protection: **Intrinsic Safety**

Marking: **[Ex ia Ga] IIC (Ta = -40°C to +70°C)**

Approved for issue on behalf of the IECEX
Certification Body:

P Oates

Position:

Engineering Manager

Signature:
(for printed version)

Date:
(for printed version)

19/12/2025

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Certificate issued by:

SGS UK Limited
Rockhead Business Park
Staden Lane
Buxton, Derbyshire SK17 9RZ
United Kingdom





IECEx Certificate of Conformity

Certificate No.: **IECEx BAS 17.0071U**

Page 2 of 5

Date of issue: 2025-12-19

Issue No: 2

Manufacturer: **Scully Signal Company**
70 Industrial Way
Wilmington
Massachusetts
01887-0588
United States of America

Manufacturing
locations: **Scully Signal Company**
70 Industrial Way
Wilmington
Massachusetts
01887-0588
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The component and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2023 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"
Edition:7.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the component listed has successfully met the examination and test requirements as recorded in:

Test Reports:

[GB/BAS/ExTR17.0246/00](#)

[GB/SGS/ExTR24.0016/00](#)

[GB/SGS/ExTR25.0159/00](#)

Quality Assessment Report:

[GB/BAS/QAR13.0018/07](#)



IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 17.0071U**

Page 3 of 5

Date of issue: 2025-12-19

Issue No: 2

Ex Component(s) covered by this certificate is described below:

The ST-47C Component Module is designed to ensure a satisfactory ground contact between a terminal loading rack, and a tank or tank vehicle which is in the process of loading or unloading hazardous liquid. In the event of a good ground connection being lost, the module energises an integral electro-mechanical relay that has volts free contacts available to the user.

The product line also includes the ST-46C, a variant of the ST-47C that is functionally and electronically identical. While used in a slightly different application. As part of the Scully Vapor Connect System, the ST-46C monitors the vapor recovery hose connection during loading and automatically shuts down operations if the hose disconnects. It uses a proprietary signal from a proximity sensor in the vapor coupler, ensuring secure operation and preventing unauthorized overrides. Loading can only begin once a valid connection signal is received.

The module comprises a printed circuit board containing a mains voltage energised d.c. power supply, an electronic circuit, an electromechanical output relay and terminals for external connections. The relay contacts are rated at 250V a.c., 5A resistive load.

The ST-46C and ST-47C Series comprises models ST-47C-120 / ST-46C-120 and ST-47C-240 / ST-46C-240. Models ST-47C-120 / ST-46C-120 are fitted with a transformer suitable for 120V mains input and Models ST-47C-240 / ST-46C-240 are fitted with a transformer suitable for 240V mains input.

ST-47C-120 / ST-46C-120 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 127V_{rms}$

The ST-47C-120 / ST-46C-120 are designed to operate from an a.c. supply voltage of nominally 120V. The relay contacts are rated at 5A.

ST-47C-240 / ST-46C-240 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 253V_{rms}$

The ST-47C-240 / ST-46C-240 are designed to operate from an a.c. supply voltage of nominally 240V. The relay contacts are rated at 5A.

Intrinsically Safe Terminals - TB2

U_o	= 58V
I_o	= 16mA
P_o	= 120.7mW
C_o	refer to the table below
L_o	refer to the table below

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu H/\Omega$)
IIC	0.03	147		218
IIB	0.23	590		872
IIA	0.8	1180		1745

The parameters in the table above apply when one of the two conditions below is given:

- the total L_i of the external circuit (excluding the cable) is < 1% of the L_o value or
- the total C_i of the external circuit (excluding the cable) is < 1% of the C_o value.

The parameters in the table above are reduced to 50% when both of the two conditions below are given:

- the total L_i of the external circuit (excluding the cable) $\geq 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.



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The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of C_i plus cable capacitances respectively.

SCHEDULE OF LIMITATIONS:

- 1 - The modules must be installed in an enclosure which provides a degree of protection of at least IP20.
- 2 - The intrinsically safe wiring to the module must be adequately segregated from the non-intrinsically safe wiring.



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Certificate No.: **IECEx BAS 17.0071U**

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Date of issue: 2025-12-19

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variation 2.1

To update the certificate to reference IEC 60079-11:2023 Ed.7.

Variation 2.2

To include the ST-46C series model

ExTR: **GB/SGS/ExTR25.0159/00**

File Reference: **25/0534**



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx BAS 17.0134X	Page 1 of 5	<u>Certificate history:</u>
Status:	Current	Issue No: 2	Issue 1 (2025-09-09) Issue 0 (2018-03-13)
Date of Issue:	2025-12-19		
Applicant:	Scully Signal Company 70 Industrial Way Wilmington Massachusetts 01887-0588 United States of America		
Equipment:	Type ST-47C Groundhog Unit and ST-46C Vapor Connect System		
Optional accessory:			
Type of Protection:	Flameproof, Intrinsically Safe, Encapsulation		
Marking:	Ex db [ia Ga] mb IIB T5 Gb (Tamb = -40°C to 60°C)		

Approved for issue on behalf of the IECEx
Certification Body:

P Oates

Position:

Engineering Manager

Signature:
(for printed version)

Date:
(for printed version)

19/12/2025

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



Certificate issued by:

SGS UK Limited
Rockhead Business Park
Staden Lane
Buxton, Derbyshire SK17 9RZ
United Kingdom





IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 17.0134X**

Page 2 of 5

Date of issue: 2025-12-19

Issue No: 2

Manufacturer: **Scully Signal Company**
70 Industrial Way
Wilmington
Massachusetts 01887-0588
United States of America

Manufacturing
locations: **Scully Signal Company**
70 Industrial Way
Wilmington
Massachusetts 01887-0588
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2023 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:7.0

IEC 60079-18:2014 Explosive atmospheres – Part 18: Equipment protection by encapsulation "m"
Edition:4.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/BAS/ExTR17.0371/00

GB/SGS/ExTR24.0030/00

GB/SGS/ExTR25.0160/00

Quality Assessment Report:

GB/BAS/QAR13.0018/07



IECEx Certificate of Conformity

Certificate No.: **IECEx BAS 17.0134X**

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Date of issue: 2025-12-19

Issue No: 2

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Type ST-47C Groundhog Unit continuously monitors the earthing connection during loading operations. The control unit with the internal, component certified, electronic module and defined, component operators, together with associated probes as detailed below, provide automatic shut down when the earth connection is broken during the loading process.

The product line also includes the ST-46C, a variant of the ST-47C that is functionally and electronically identical. While used in a slightly different application. As part of the Scully Vapor Connect System, the ST-46C monitors the vapor recovery hose connection during loading and automatically shuts down operations if the hose disconnects. It uses a proprietary signal from a proximity sensor in the vapor coupler, ensuring secure operation and preventing unauthorized overrides. Loading can only begin once a valid connection signal is received.

ST-47C and ST-46C are rated 250 Va.c, 5 A.

Both units comprise a cast aluminium housing with a flanged cover attached using 16 stainless steel socket head screws of grade A2-70. The cover may be fitted with up to two signal lamps to TRAC 12 ATEX 0033U coded Ex d mb IIC Gb, Ex mb tb IIIC Db and a flameproof operator switch to DEMKO 15 ATEX 1575U coded Ex db IIC Gb.

The enclosure base contains certified intrinsically safe control module as detailed below: -

ST-47C to Baseefa17ATEX0088U coded [Ex ia Ga] IIB ($T_{amb} = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$) with the following input/output parameters:

ST-47C-120 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 127\text{Vrms}$

The ST-47C-120 is designed to operate from an a.c. supply voltage of nominally 120V. The relay contacts are rated at 5A.

ST-47C-240 Safe Area Terminals - TB1 Terminals 2 to 9

$U_m = 253\text{Vrms}$

The ST-47C-240 is designed to operate from an a.c. supply voltage of nominally 240V. The relay contacts are rated at 5A.

Intrinsically Safe Terminals - TB2

$U_o = 58\text{V}$

$I_o = 16\text{mA}$

$P_o = 120.7\text{mW}$

C_o refer to the table below

L_o refer to the table below

Continued on Page 4.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. Flamepaths must not be repaired.
2. Wipe with damp cloth to reduce the potential for electro-static discharge. See instructions



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Certificate No.: **IECEx BAS 17.0134X**

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Date of issue: 2025-12-19

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Equipment (continued):

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu\text{H}/\text{ohm}$)
IIC	0.03	147		218
IIB	0.23	590		872
IIA	0.8	1180		1745

The parameters in the table above apply when one of the two conditions below is given:

- The total L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value or
- The total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.

The parameters in the table above are reduced to 50% when both of the two conditions below are given:

- The total L_i of the external circuit (excluding the cable) $\geq 1\%$ of the L_o value and
- The total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of C_i plus cable capacitances respectively.



IECEx Certificate
of Conformity

Certificate No.: IECEx BAS 17.0134X

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Date of issue: 2025-12-19

Issue No: 2

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variation 2.1

To update the certificate to reference IEC 60079-11:2023 Ed.7.

ExTR: GB/SGS/ExTR25.0160/00

File Reference: 25/0534



EU Declaration of Conformity

This Declaration of Conformity is issued under the sole responsibility of the manufacturer

Scully Signal Company (Headquarters)	70 Industrial Way, Wilmington, MA 01887-479, USA Tel: 800.272.8559 / 617.692.8600 email: sales@scully.com
Scully Systems Europe NV	Maanstraat 25, 2800 Mechelen, Belgium Tel: +32 (0) 15 56 00 70 email: info@scully.com
Scully UK Ltd	Meridian House, Unit 33, 37 Road One Winsford Industrial Estate, Winsford Cheshire CW7 3QG, United Kingdom Tel: +44 (0) 1606 553805 email: sales@scullyuk.com
Scully India	Regus Business Centre, Level 15, Dev Corpora, Eastern Express Highway, Thane - 400601, Maharashtra, India Tel: + 91 982 1799566 email: SalesIndia@scully.com

Equipment Type:

Groundhog ST-47C-120/240 -E, -EL or -ELK

Vapor Connect ST-46C-120/240 -E, -EL or -ELK

Scully Signal Company declares that this equipment meets all requirements per the following:

- Potentially Explosive Atmosphere (ATEX) Directive 2014/34/EU
- Electromagnetic Compatibility Directive 2014/30/EU

SGS Fimko Oy Notified Body 0598 performed an assessment to all relevant ATEX directive standards and issued certificate Baseefa17ATEX0158

Scully Signal company declares that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms to all essential technical requirements of the following standards:

EN 60079-0:2018 - Explosive atmospheres; Equipment — General requirements
 EN 60079-1:2014 - Explosive atmospheres; Equipment protection by flameproof enclosures "d"
 EN 60079-11:2024 - Explosive atmospheres; Equipment protection by intrinsic safety "i"
 ISO/IEC 80079-34:2011 - Application of quality systems for equipment manufacture
 IEC 61000-6-2:2005 - Generic Standards – Immunity Standard for Industrial Environments
 IEC 61000-6-4:2006 - Generic Standards – Emission Standard for Industrial Environments

Date and Place of Issue: 16 January, 2026, Wilmington Massachusetts, USA

Under Authority:

James Carrington
 Ex Authorized Person
 Principal Sustaining, Compliance, & Test Engineer
 Scully Signal Company

Signature: James H. Carrington, Jr.



Manufacturer's Attestation of Conformity

This Attestation of Conformity is issued under the sole responsibility of the manufacturer

Scully Signal Company (Headquarters)	70 Industrial Way, Wilmington, MA 01887-479, USA Tel: 800.272.8559 / 617.692.8600 email: sales@scully.com
Scully Systems Europe NV	Maanstraat 25, 2800 Mechelen, Belgium Tel: +32 (0) 15 56 00 70 email: info@scully.com
Scully UK Ltd	Meridian House, Unit 33, 37 Road One Winsford Industrial Estate, Winsford Cheshire CW7 3QG, United Kingdom Tel: +44 (0) 1606 553805 email: sales@scullyuk.com
Scully India	Regus Business Centre, Level 15, Dev Corpora, Eastern Express Highway, Thane - 400601, Maharashtra, India Tel: + 91 982 1799566 email: SalesIndia@scully.com

Component Type: ST-47-120/240 and ST-46-120/240

Scully Signal Company declares that this component meets all requirements per the following:

- **Potentially Explosive Atmosphere (ATEX) Directive 2014/34/EU**
- **Electromagnetic Compatibility Directive 2014/30/EU**

SGS Fimko Oy Notified Body 0598 performed an assessment to all relevant ATEX directive standards and issued certificate **Baseefa17ATEX0088U**.

Scully Signal company declares that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms to all essential technical requirements of the following standards:

EN 60079-0:2018 - Explosive atmospheres; Equipment — General requirements
EN 60079-11:2024 - Explosive atmospheres; Equipment protection by intrinsic safety "I"
ISO/IEC 80079-34:2011 - Application of quality systems for equipment manufacture
IEC 61000-6-2:2005 - Generic Standards – Immunity Standard for Industrial Environments
IEC 61000-6-4:2006 - Generic Standards – Emission Standard for Industrial Environments

The product is intended for applications where the environment requires **Ex II (1) G [Ex ia Ga] IIC (-40°C ≤ Ta ≤ +70°C)**
And must be installed with the following limitations:

- 1: The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE Ci (μF)	INDUCTANCE Li (mH)	L/R Rat(μH/ohm)
IIC	0.03	147	218
IIB	0.23	590	872
IIA	0.8	1180	1745

- 2: The module must be installed in an enclosure which provides a degree of protection of at least IP20. The degree of protection provided must be suitable for the intended use.

- 3: The intrinsically safe wiring to the module must be adequately segregated from the non-intrinsically safe wiring.

Date and Place of Issue: 16 January, 2026, Wilmington Massachusetts, USA

Under Authority:

James Carrington
Ex Authorized Person
Principal Sustaining, Compliance, & Test Engineer
Scully Signal Company

Signature: James H. Carrington, Jr.

Setting Standards in Safety & Dependability Since 1936

Scully engineers and builds products to the highest safety and reliability standards.

Represented in more than 50 countries, Scully has direct sales and service personnel in North America, Europe, the United Kingdom, Southeast Asia, and India.

For more information and 24 hour technical assistance,
call Scully Signal Company at 1-800-2SCULLY (1-800-272-8559).

Scully Headquarters in Wilmington, MA U.S.A.

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