

Scully ST-46C

Technical Manual



ST-46C Scully Vapor Connect System



ST-46C - Technical Manual

Table of Contents

General		4.
1.1	Description	
1.2	Technical Specifications	
1.3	Accessory Equipment	
Installation		8.
2.1	Mechanical Installation	
2.2	Electrical Installation	
2.3	Initial System Checkout	
Maintenance		11.
3.1	Enclosure	
3.2	Corrosion Protection	
3.3	Control Module (Circuit Board)	
3.4	Module Replacement	
3.5	Indicator Lights	
3.6	Control (Bypass) Switch	
3.7	Junction Box and Plug & Cable Unit	
3.8	Troubleshooting	
Diagram Appendix		
4.1	DWG 31412 – Outline Drawing – Control Unit Enclosure	14.
4.2	DWG 63039 – Outline Drawing – Sculcon Junction Box	15.
4.3	DWG 603000023 – Mounting Diagram – Control Unit, & hose/flange assembly	16.
4.4	DWG 606000019 – Interconnection Diagram - ST-46C-ELK	17.
4.5	DWG 603000022 – Installation Wiring Diagram, ST-46C	18.
4.6	DWG 603000032 – Installation Drawing, ST-46C With Entity Parameters	19.
4.7	Replacement Parts ST-46C-120	20.
4.8	Replacement Parts ST-46C-240	21.
4.9	DWG 603000024 – Vapor Coupler Installation	22.

Certification Appendix

ATEX - EU-Type Examination Certificates

ST-46C Module (Component) - Baseefa17ATEX0088U	Pages 25-28
ST-46C Equipment - Baseefa17ATEX0158X	Pages 29-31
Vapor Hose Sensor - SGS25ATEX0100X	Pages 32-36

IECEX Certificates of Conformity

ST-46C Module (Component) - IECEX BAS 17.0071U	Pages 37-41
ST-46C Equipment - IECEX BAS 17.0134X	Pages 42-44
Vapor Hose Sensor - IECEX SGS 25.0050X	Pages 45,46

Attestation/Declaration

ST-46C Module (Component) Attestation of Conformity	Page 47
ST-46C Equipment Declaration of Conformity	Page 48
Vapor Hose Sensor Declaration of Conformity	Page 49

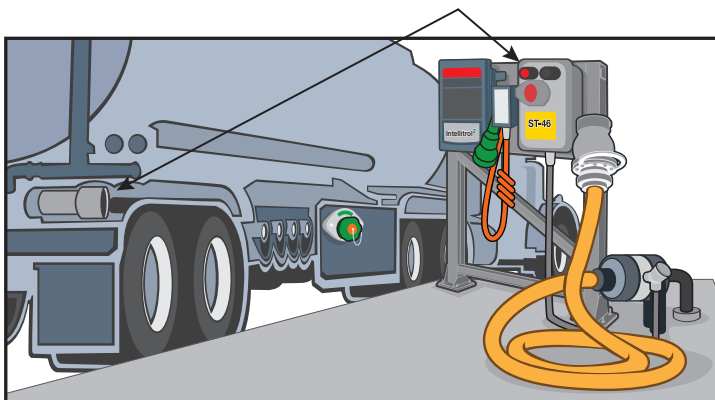
The ST-46C Scully Vapor Connect Controller is an integral component of the Vapor Connect System. It is an intelligent controller that continuously and automatically monitors the vapor recovery hose or loading arm connection between the vapor coupler and the tank truck vapor adaptor during loading operations. The ST-46C is designed to immediately shut down the loading operation if the vapor coupler becomes disconnected from the tank truck.

1.1 Description

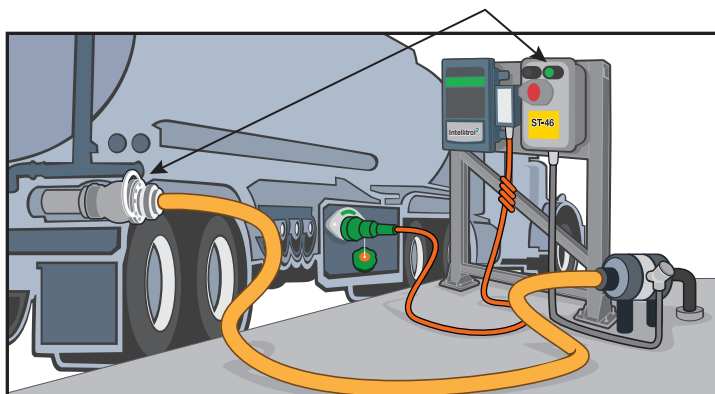
The ST-46C is mounted at the gantry (loading terminal). Indicator lights on the cover provide a visual reference to confirm whether or not a proper connection has been made. The controller also includes a dry relay that changes state based on the presence or absence of a connection. A signal from the Load-Computer can be wired through this relay, allowing terminal operations to incorporate the Scully Vapor Connect System into the loading permit logic. If this logic is applied and the vapor recovery hose is disconnected from the truck, the system will automatically shut down the loading operation. Alternative integration methods are available depending on the specific equipment used at the gantry.

The ST-46C controller monitors a proximity sensor integrated into the vapor coupler at the end of the vapor hose. The signal between the controller and the sensor is proprietary to Scully, making it difficult to bypass or override without approval. Before loading can begin, the controller must receive a valid return signal from the coupler, indicating that a proper vapor recovery hose connection has been established.

**Unconnected,
The System Should Show RED**



**When the Hose is Connected,
the Controller Should Show GREEN**



1.1.1 Model Designations

The ST-46C Controller is available in 120VAC or 240VAC models with control (Bypass) Switch.

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

Model	Description
ST-46C-120 ELK	Controller in Explosion-proof Enclosure with Indicator Lights and Key-lockable Bypass Switch, 120VAC
ST-46C-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 vapor recovery hose connection is verified. Controller output is in permissive state i.e. permit to load.
OFF	ON	A good vapor recovery hose connection is not verified. Controller output is in non-permissive state.
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 vapor recovery hose 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 vapor recovery hose connection 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 vapor recovery hose connection verification is DISABLED and the system does not provide connection verification.

1.2 Technical Specifications

Temperature Range	-40°C to +60°C (-40°F to +140°F)			
Power Requirements	120 VAC 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 load contact			
Vehicle Interface	Scully Vapor Coupler, Flange, and Cable kit			
Output Relay	One normally open volt-free contact rated 250VAC, 5A resistive max. The output contact closes when a proper Vapor Recovery 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	- IECEx BAS 17.0134X IEC 60079-0:2017; IEC 60079-1:2014; IEC 60079-11:2023; IEC 60079-18:2014 Ex db [ia Ga] mb IIB T5 Gb (-40°C ≤ Ta ≤ +60°C) - Baseefa17ATEX0158X EN IEC 60079-0:2018; EN IEC 60079-1:2014; EN IEC 60079-11:2024; EN IEC 60079-18:2015 Ⓔ II 2(1) G Ex db [ia Ga] mb IIB T5 Gb (-40°C ≤ Ta ≤ +60°C)			
ST-46C:	Entity Parameters: Um 127 or 253 VRMS			
	Uo 58V	Io 16mA	Po 120.7mW	
	IS Area Load Maximums			
	Group	Capacitance Co (uF)	Inductance Lo (mH)	L/R Ratio(uH/Ω)
	IIC	0.03	147	218
	IIB	0.23	590	872
	IIA	0.8	1180	1745
	- IECEx SGS 25.0050X - IEC 60079-0:2017; IEC 60079-11:2023 Ex ia IIB T4 Ga (-40°C ≤ Ta ≤ +60°C) - SGS25ATEX0100X - EN IEC 60079-0: 2018 EN IEC 60079-11: 2024 Ⓔ II 1G Ex ia IIB T4 Ga (-40°C ≤ Ta ≤ +60°C)			
	Entity Parameters:			
	Ui 58V	Ii 16mA	Pi 120.7mW	Ci 0 Li 0
Vapor Coupler Sensor:				
ATEX Specific Conditions for Safe Use	- Flamepaths must not be repaired. - Wipe with damp cloth to reduce the potential for electro-static discharge. - Do not open when an explosive gas atmosphere is present. - The sensor housing may be made of aluminium alloy, therefore, care should be taken to protect it from impact or abrasion if located in a zone 0 area.			

General

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-46C 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-46C may only be repaired by replacing the internal control module. The internal control module is not field-repairable.

1.3 Accessory Equipment

In addition to the control unit and Vapor Sensor assembly, a coupler and cable assembly is needed to provide the interconnection from the ST-46C Control Unit to the vehicle.

See section 4.8 DWG 603000024

The ST-46C 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-46C 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 603000023 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.

Refer to section 4.9 (DWG 603000024 – Vapor Coupler Installation) for detailed instructions on the Vapor Coupler installation and wiring.

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 vapor recovery hose 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 to interface with the sensor integrated in the vapor coupler. 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-46C 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 vapor recovery hose connection between the vehicle and the controller and the vehicle has been established (or when optional bypass switch is in the "Bypass" position).

The contact opens if the vapor recovery hose connection 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: The ST-46C's relay output contact is designed to directly control a valve or pump. Do not connect directly logic circuits of a TAS without reviewing the logic solver requirements of the TAS input as this can introduce unsafe failure modes into this emergency shutdown system. The TAS may also control a valve or pump based on other conditions.

2.2.4 Intrinsically Safe Connections to Vapor Recovery Hose Coupler

Signals from ST-46C to the vapor recovery hose coupler 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.

All wiring installation should be in accordance with local wiring codes.

Refer to section 4.8 for Vapor Coupler installation instructions.

2.3 Initial System Checkout

2.3.1 Operational Testing

Apply power to the ST-46C control unit.

NOTE: *The vapor recovery hose coupler should not be connected to a truck or test coupler at this time.*

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

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 Vapor Coupler to a truck or test coupler. ST-46C outputs will go permissive with green light ON and red light OFF. If a truck or test coupler is not available, pushing the poppet of the vapor coupler to its open position will also simulate a coupler to adapter connection and the ST-46C will change to a permissive state.

CAUTION: BEFORE PERFORMING ANY MAINTENANCE ON THE CONTROL UNIT, DISCONNECT POWER TO THE ST-46C 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-46C 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-46C 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-46C 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-46C Control Unit. Make sure the work area is gas vapour free.
2. To open the ST-46C Control Unit cover, remove the (16) hex socket head bolts by using a 6mm hex wrench.
3. Use a volt meter to confirm there is no voltage on any terminal on TB1 (ref. section 4.4, DWG 606000019)
4. Mark/label wires connected to TB1 on printed circuit board (to be able to reconnect to the same terminal numbers on the replacement module).
5. Disconnect all wires connected to TB1.
6. Mark/label wires connected to TB2.
7. Disconnect all wires connected to TB2.
8. 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.

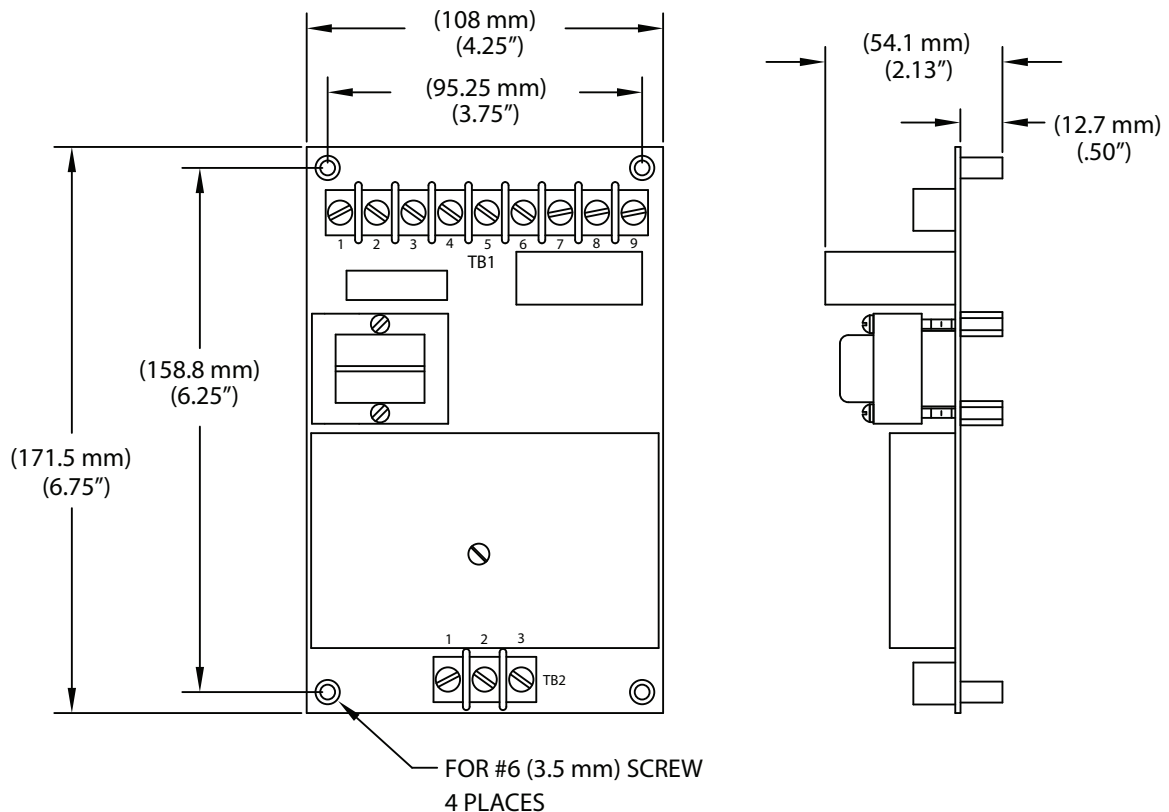


Figure 1: ST-46C Control Module Illustration

Note: The ST-46C Replacement Control Module cannot be repaired in the field. A damaged or faulty module must be replaced with an equivalent Scully ST-46C Control Module. The ST-46C 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 any substance which may corrode or degrade the material of the module (including water, sealants, or cleaning agents).

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).

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.

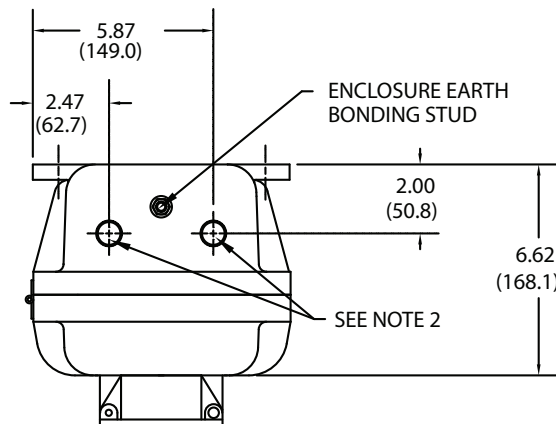
3.7 Troubleshooting

The following troubleshooting guide should aid in an initial diagnosis of most problems encountered with installation and operation of ST-46C.

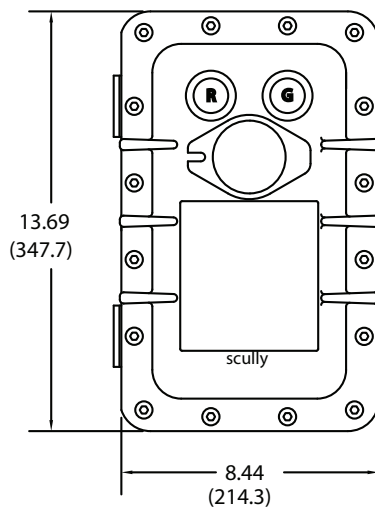
Condition	Possible Cause
No lights ON, on front cover	- No power to control unit - Control (Bypass) Switch in BYPASS position - Bulb blown (on older units with incandescent lamps) - Input power fuse (F1) is blown - Control Module is defective - Bad wiring to lamps
Green (Permissive) light ON, but control 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 Vapor Coupler connected to vehicle or test coupler equipped	- Fault in wiring between ST-46 TB2 and sensor in Vapor Coupler - Vapor Coupler not properly seated to truck or test socket - Control Module is defective - Vapor Sensor or coupler is defective

4.1 DWG 31412 – Outline Drawing – Control Unit Enclosure

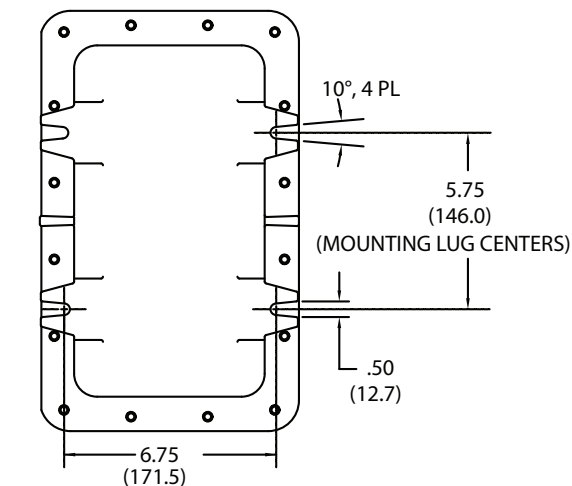
31412 RevC



TOP VIEW

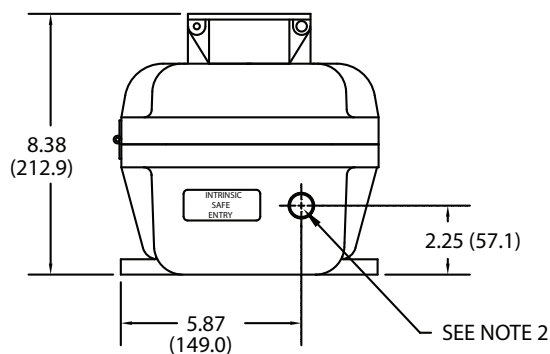


FRONT VIEW



(MOUNTING LUG CENTERS)

REAR VIEW

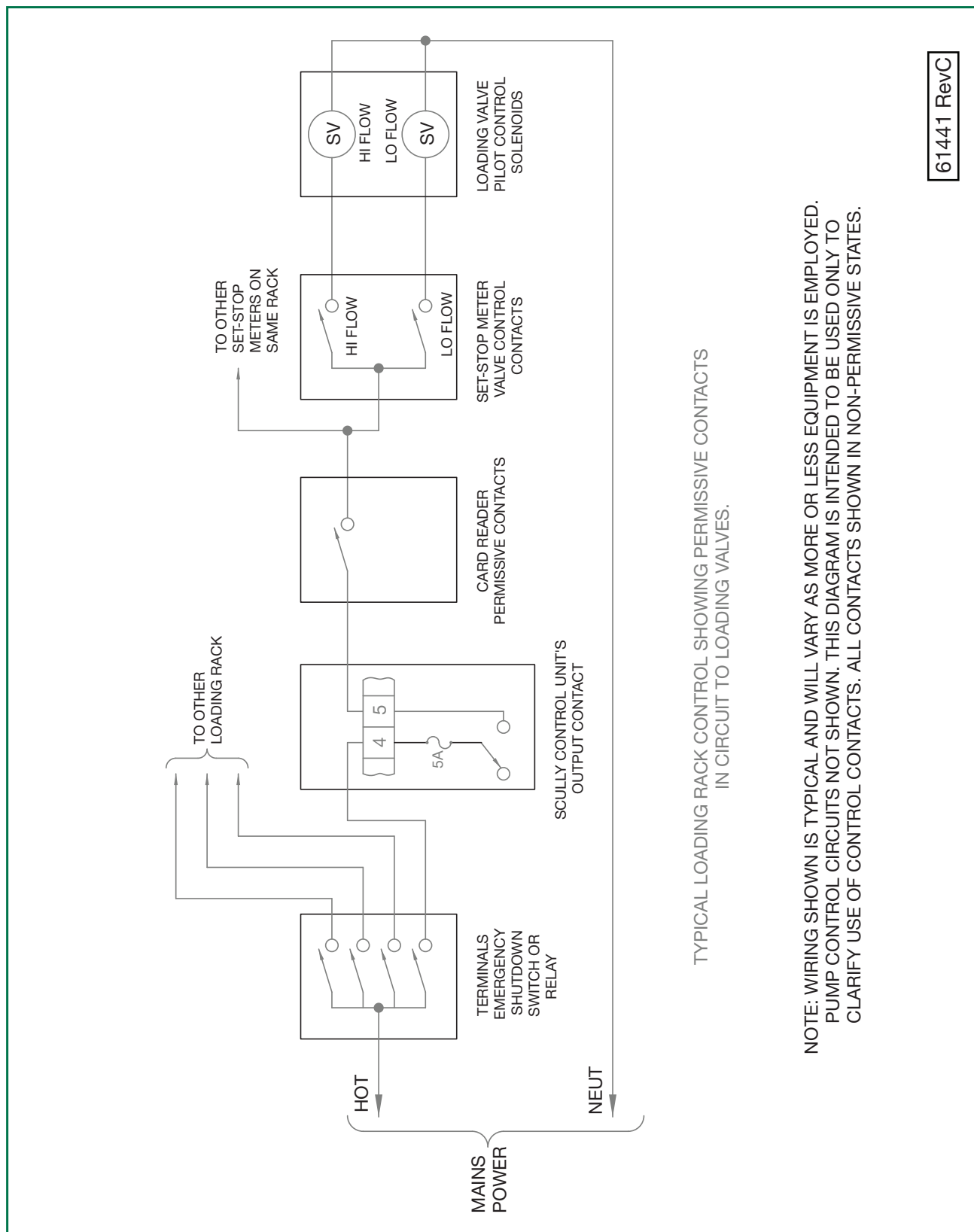


BOTTOM VIEW

NOTES:

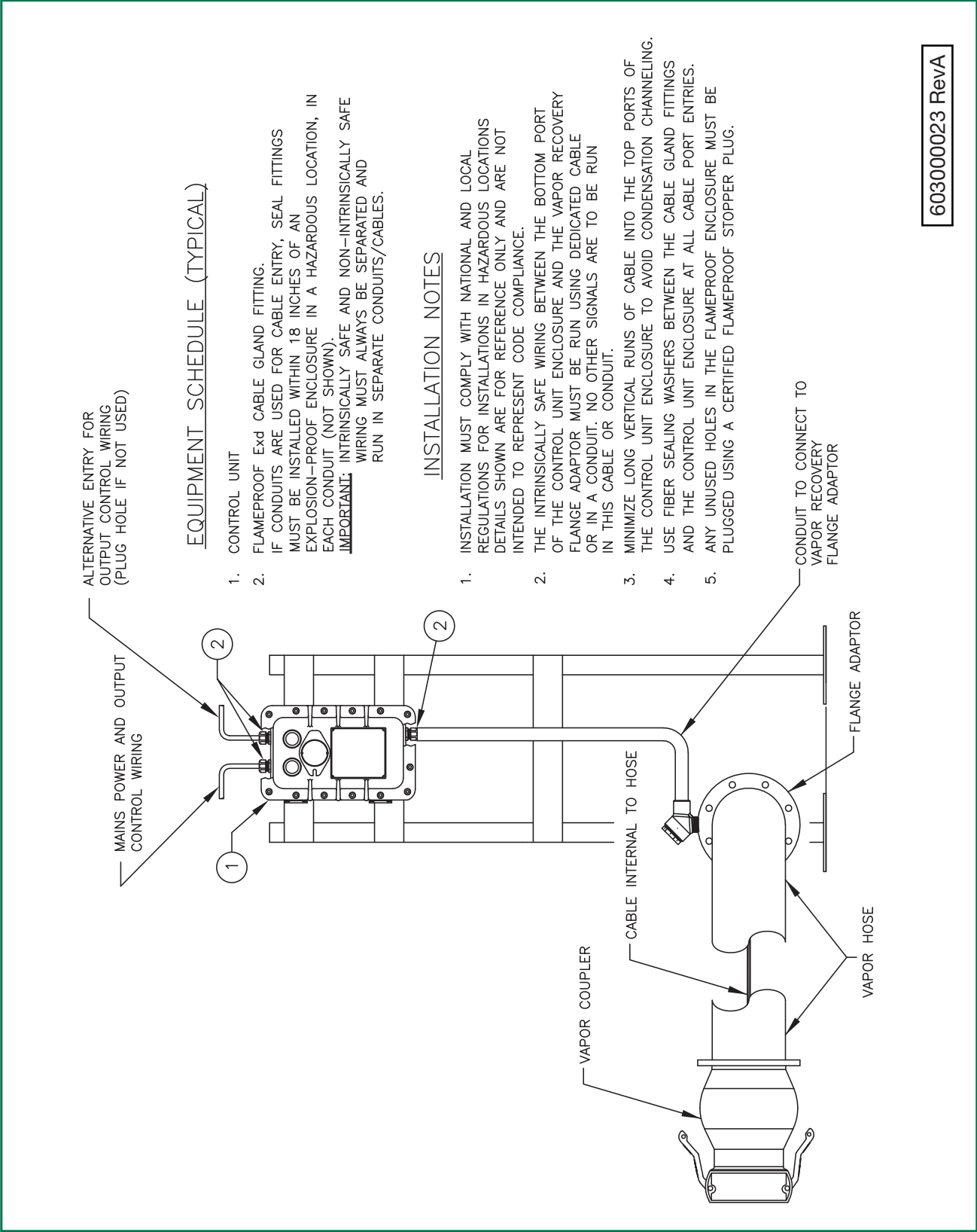
1. DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN PARENTHIESS.
2. ENTRY HOLES:
NORTH AMERICAN APPROVED MODELS: 3/4" NPT
TEX/IECEx APPROVED MODELS: M20 X 1.5

4.2 DWG 61441 – Wiring Diagram – Typical Loading Rack Control

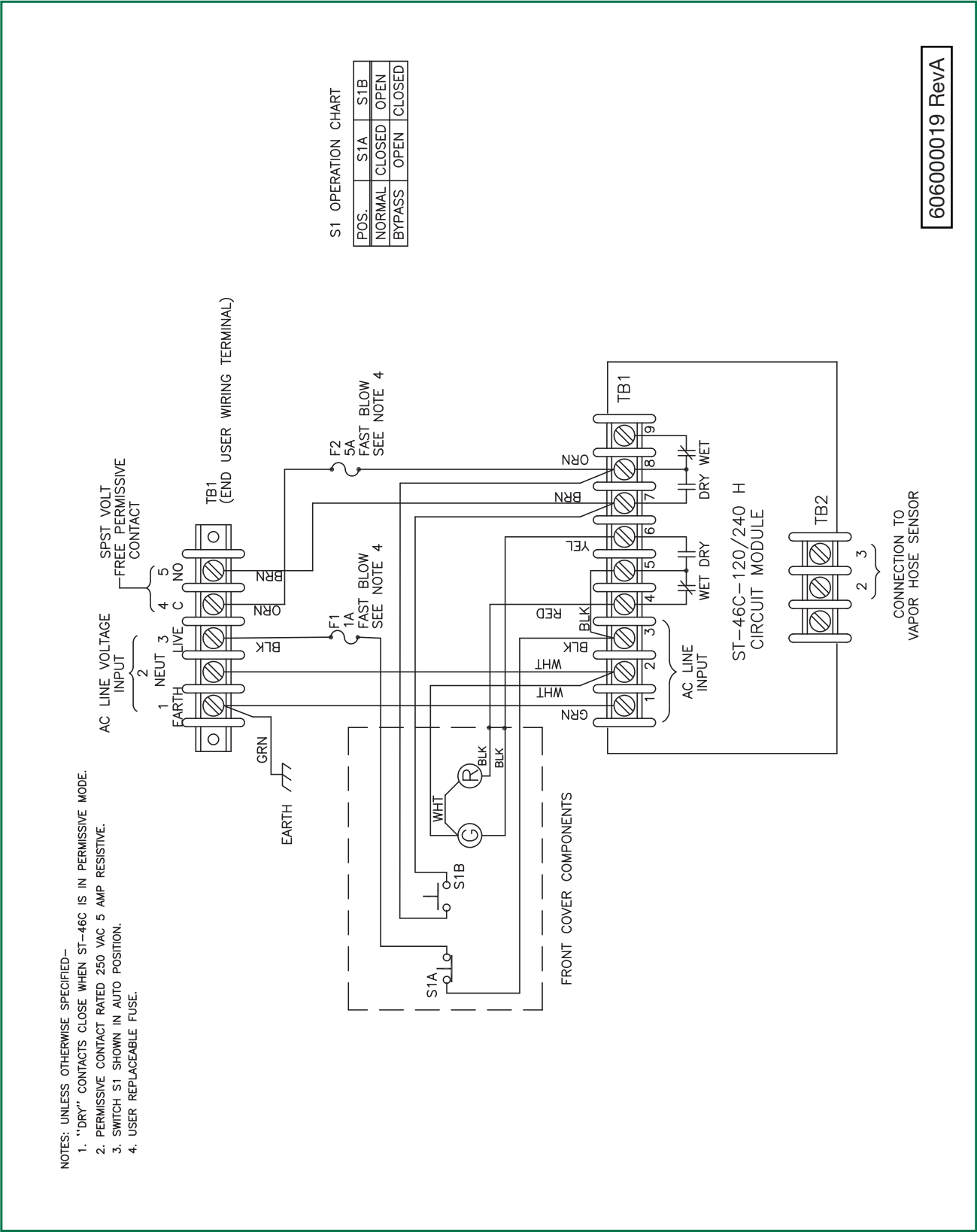


61441 RevC

4.3 DWG 603000023 – Mounting Diagram – Control Unit

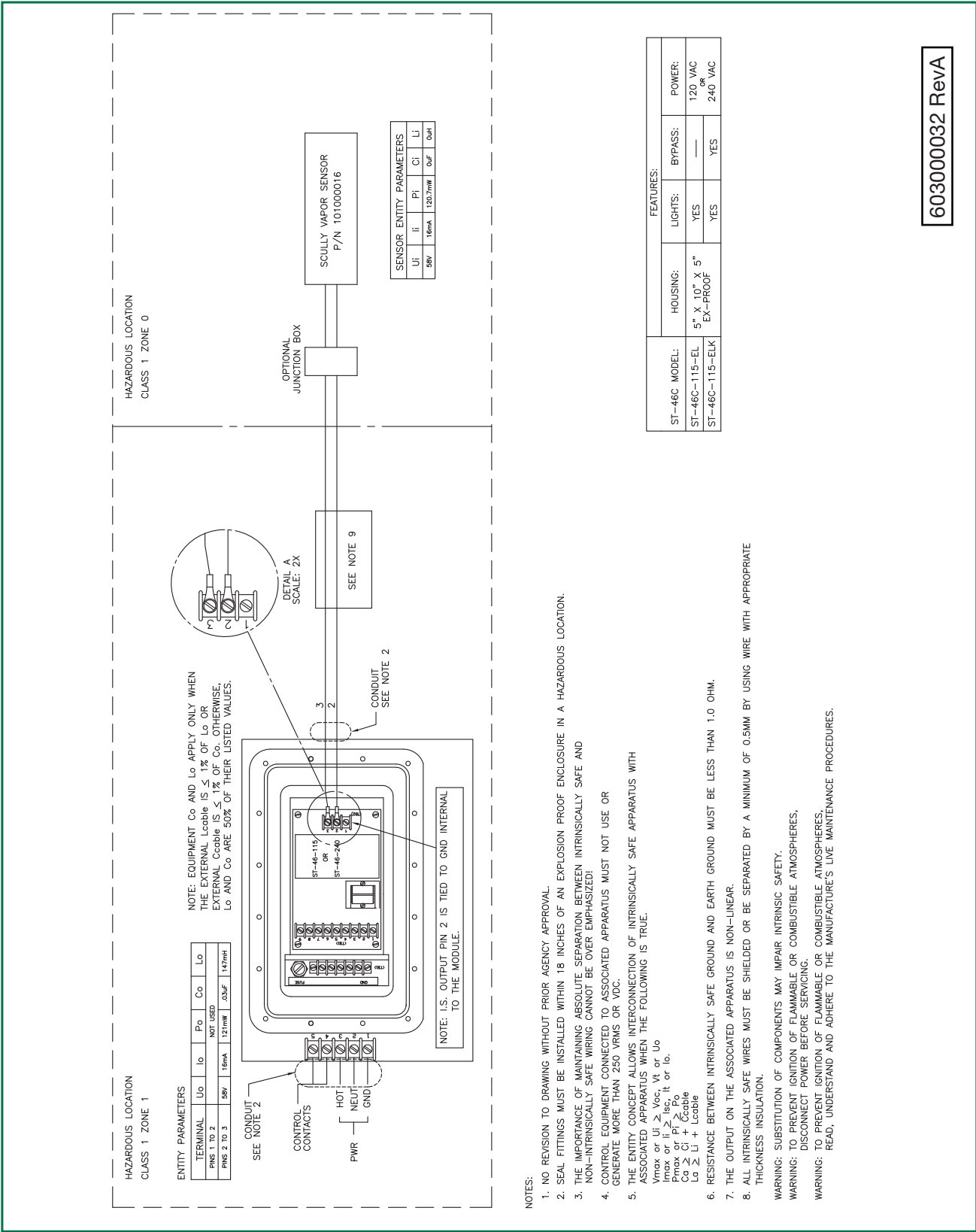


4.4 DWG 606000019 – Interconnection Diagram - ST-46C-ELK



606000019 RevA

4.6 DWG 603000032 – Installation Drawing, ST-46C With Entity Parameters



4.7 Replacement Parts ST-46C-120

REPLACEMENT PARTS for ST-46C 120VAC

ST-46C 120VAC

ATEX Models

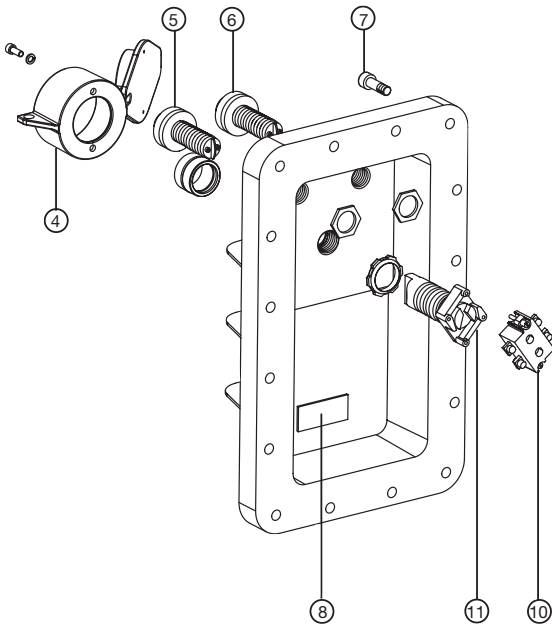
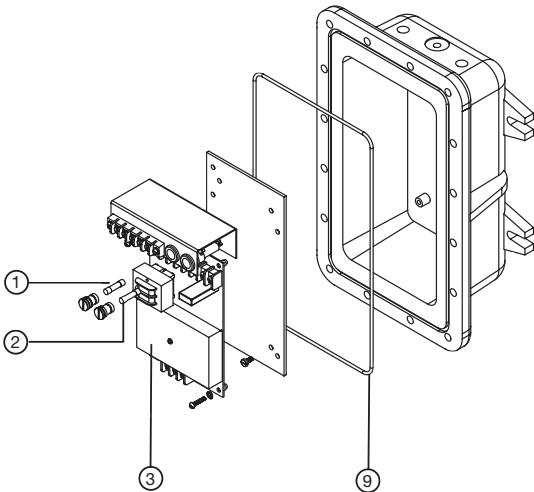
Part No.	Model
091000029	ST-46C-120 ELK

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	091000031	ST-46C-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.



4.8 Replacement Parts ST-46C-240

REPLACEMENT PARTS for ST-46C 240VAC

ST-46C 240VAC

ATEX Models

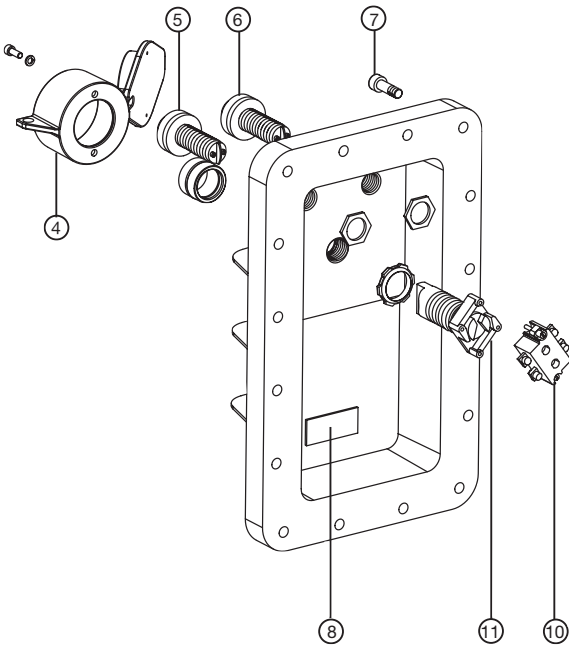
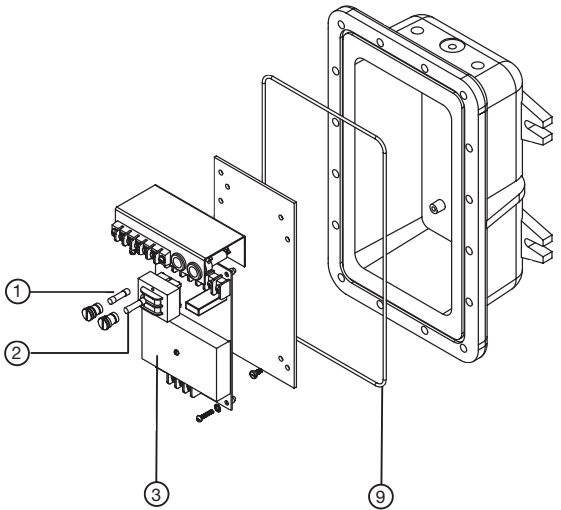
Part No.	Model
091000030	ST-46C-240 ELK

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	091000032	ST-46C-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.

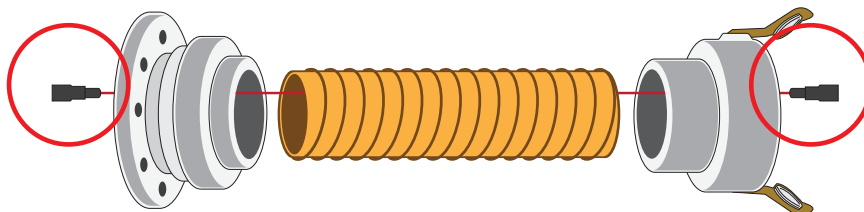


4.9 DWG 603000024 – Vapor Coupler Installation

ASSEMBLY STEPS

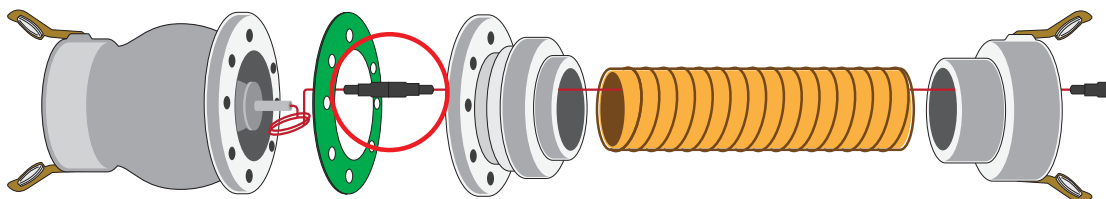
Step 1:

Route the supplied Signal Transfer cable through the vapor hose.



Step 2:

Connect the Signal Transfer Cable to the mating cable on the vapor coupler.

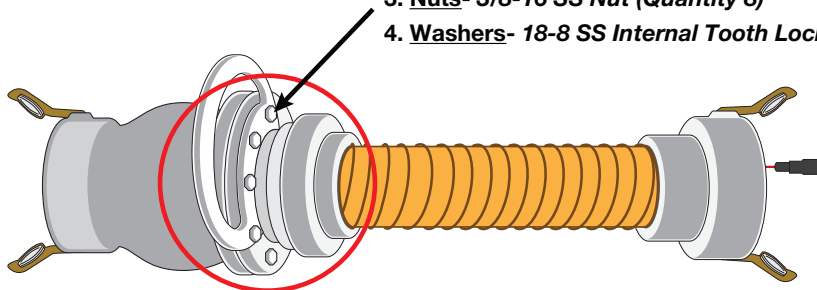


Gasket Recommendation: 4 X 1/16 Thick Fiber GTMA Full Face Gasket.

Step 3:

While the cable still attached, attach the coupler to the hose flange with necessary hardware AND the supplied carry handle.

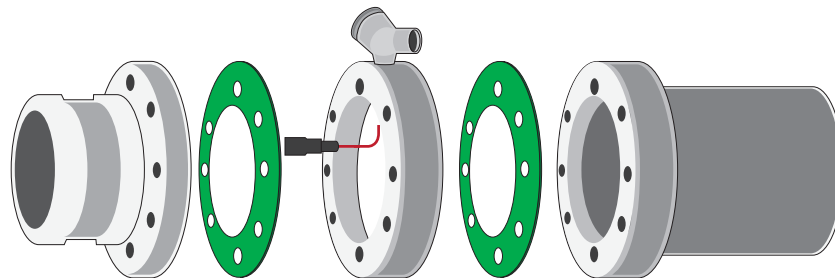
1. Long Screws- 3/8-16 SS, 1-5/8 Long Screw to Attach Handle (Quantity 4)
2. Short Screws- 3/8-16 SS, 1-3/8 Long Screw (Quantity 4)
3. Nuts- 3/8-16 SS Nut (Quantity 8)
4. Washers- 18-8 SS Internal Tooth Lock Washer for 3/8" Screw Size (Quantity 8)



ASSEMBLY STEPS *cont.*

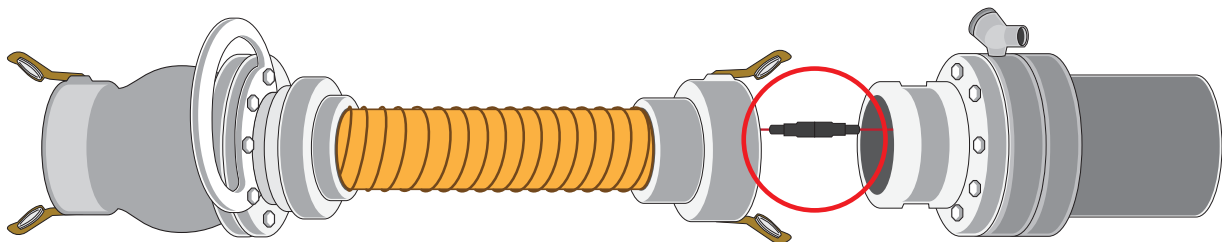
Step 4:

Install the Flange assembly (with the integrated cable) to the rack. Attach with necessary hardware. Shown is an example where the flange is attached to a TTMA style flange on the rack.



Step 5:

Connect the cable from the hose to the connector on the Flange. Install the hose to the Flange assembly with necessary hardware.



*When parking the coupler when no truck is in the lane, mount the handle on the hook.
Do not connect coupler to an adapter for storing purpose.*

Step 6:

Install the ST-46 controller on the rack terminal.

Enclosure:

The ST-46 is mounted in an explosion proof & weatherproof enclosure that is typically located near other rack equipment. Refer to typical loading rack installation for suggested mounting.

Physical Location:

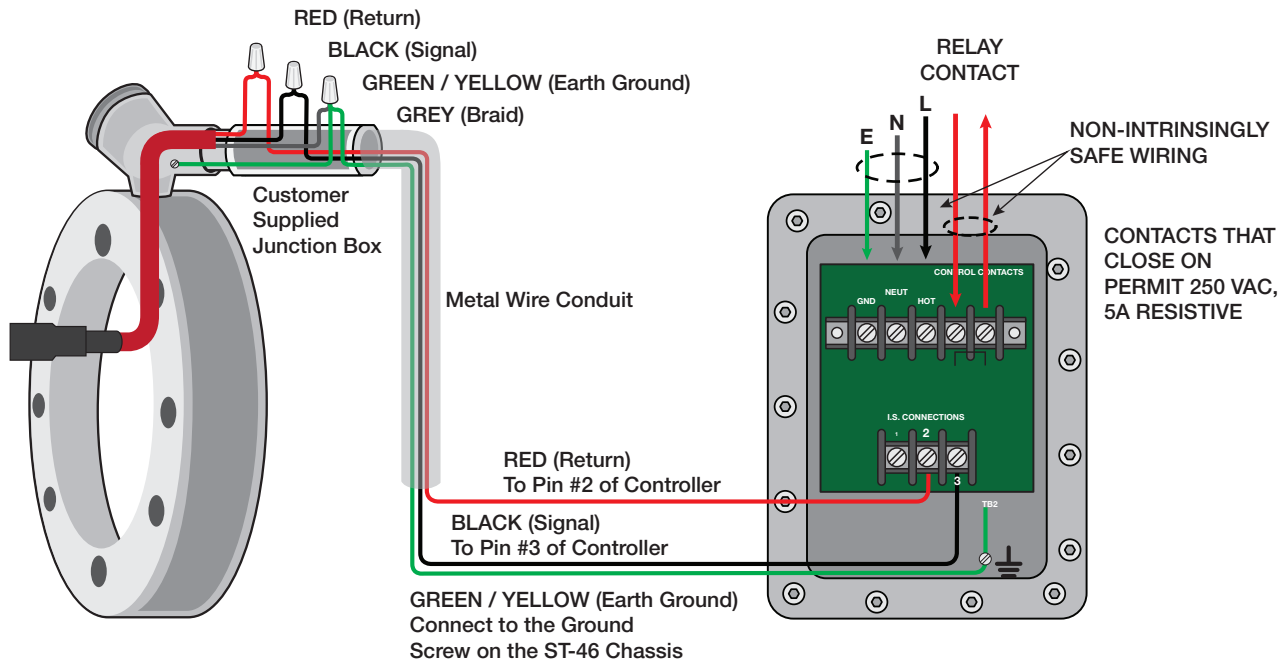
- The front panel must be in the vertical position.
- The hinged front cover must be able to swing open for ease of servicing and chassis removal.
- The front panel indicators must be visible to the loader.



ASSEMBLY STEPS *cont.***Step 7:**

Complete the wiring from the gland port to the controller per the schematic.

Note that for sake of clarity the hose is not shown

**NOTES:**

1. IMPORTANT: INTRINSICALLY SAFE AND NON-INTRINSICALLY SAFE WIRING MUST ALWAYS BE SEPARATED AND RUN IN SEPARATE CONDUITS.
2. WIRE TO BE 18 AWG MINIMUM, STRANDED AND TINNED. H07V-K OR UL 1015 RATED, AND MEET TEMPERATURE AND ENVIRONMENTAL EXPOSURE REQUIREMENTS FOR THE APPLICATION. COLOR OF WIRES SHOULD MATCH CONTROLLER TERMINAL COLORS—IF POSSIBLE. IN ALL CASES WIRING MUST MEET APPLICABLE NATIONAL, STATE AND LOCAL CODES.
3. INTERCONNECTION WIRING MUST NOT BE ALLOWED TO PASS THROUGH THE ST-46C HOUSING. UNDER NO CIRCUMSTANCES IS THE HOUSING TO BE USED AS A JUNCTION BOX. CONTROL (NON I.S.) WIRING MUST PASS IN AND OUT OF THE TOP CONDUIT ENTRY PORTS AND INTRINSIC SAFE (I.S.) WIRING MUST EXIT ONLY FROM THE BOTTOM CONDUIT ENTRY.

Certificate Number
Baseefa17ATEX0088U
Issue 2



Issued 19 December 2025
Page 1 of 4

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)



Mikko Välimäki
SGS Fimko Oy

Certificate Number
Baseefa17ATEX0088U
Issue 2



Issued 19 December 2025
Page 2 of 4

13

Schedule

14

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

$$U_o = 58V$$

$$I_o = 16mA$$

$$P_o = 120.7mW$$

$$C_o \text{ refer to the table below}$$

$$L_o \text{ refer to the table below}$$

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
Baseefa17ATEX0088U
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

Certificate Number
Baseefa17ATEX0088U
Issue 2



Issued 19 December 2025
Page 4 of 4

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
Page 1 of 3

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
Page 2 of 3

13

Schedule

14

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
Baseefa17ATEX0158X
Issue 2



Issued 19 December 2025
Page 3 of 3

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 ($\mu H/ohm$)
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.



IECEx Certificate of Conformity

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

Page 4 of 5

Date of issue: 2025-12-19

Issue No: 2

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.

	IECEx Certificate of Conformity
Certificate No.: IECEx BAS 17.0071U	Page 5 of 5
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.	
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

Certificate history:

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

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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**

Page 3 of 5

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



IECEx Certificate of Conformity

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

Page 4 of 5

Date of issue: 2025-12-19

Issue No: 2

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**

Page 5 of 5

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**



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 SGS 25.0050X	Page 1 of 3	Certificate history:
Status:	Current	Issue No: 0	
Date of Issue:	2026-05-06		
Applicant:	Scully Signal Company 70 Industrial Way Wilmington Massachusetts 01887-0588 United States of America		
Equipment:	Vapor Hose Sensor		
Optional accessory:			
Type of Protection:	Intrinsic Safety		
Marking:	Ex ia IIB T4 Ga (-40°C ≤ Ta ≤ +60°C)		

Approved for issue on behalf of the IECEx
Certification Body:

D Brearley

Position:

Lead Certification Engineer

Signature:
(for printed version)

Date:
(for printed version)

6/5/2026

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





IECEX Certificate of Conformity

Certificate No.: **IECEX SGS 25.0050X**

Page 2 of 3

Date of issue: 2026-05-06

Issue No: 0

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 60079-11:2023](#) 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 equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[GB/SGS/ExTR25.0183/00](#)

Quality Assessment Report:

[GB/EXV/QAR26.0002/00](#)



IECEx Certificate of Conformity

Certificate No.: **IECEx SGS 25.0050X**

Page 3 of 3

Date of issue: 2026-05-06

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Vapor Hose Sensor is a proximity sensor designed to detect the opening and closing of a poppet valve in a vapor recovery coupler on road fuel tankers.

The Vapor Hose Sensor comprises a printed circuit board (PCB) containing two reed switches with a diode connected in series, enclosed in a cylindrical housing made of aluminium alloy 6061-T6 or stainless steel. The housing is filled with epoxy for mechanical robustness only.

The sensor is actuated by a magnet attached to the poppet valve and is intended for connection to intrinsically safe outputs via a permanently connected cable fitted with a 3-position plug at the end. Pins 1 and 3 of the plug are electrically connected to the intrinsically safe circuit of the equipment. Pin 2 of the connector is electrically connected to the equipment's grounding terminal and has no connection to the intrinsically safe circuit.

Intrinsically Safe parameters (pins 1 and 3)

$U_i = 58V$

$I_i = 16mA$

$P_i = 120.7mW$

$C_i = 0$

$L_i = 0$

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The sensor housing may be made of aluminium alloy, therefore, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

Certificate Number
SGS25ATEX0100X



Issued 5 May 2026
Page 1 of 2

- 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: **SGS25ATEX0100X**
- 4 Product: **Vapor Hose Sensor**
- 5 Manufacturer: **Scully Signal Company**
- 6 Address: **70 Industrial Way, Wilmington, Massachusetts 01887-0588, USA**
- 7 This product and any acceptable variation thereto is specified in the schedule 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.

The examination and test results are recorded in confidential Report No. **GB/SGS/ExTR25.0183/00**
- 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 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 1G Ex ia IIB T4 Ga (-40°C ≤ Ta ≤ +60°C)

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

Project File No. **25/0549**

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Tuomas Hänninen
Tuomas Hänninen

Authorised Signatory for SGS Fimko Oy

Certificate Number
SGS25ATEX0100X



Issued 5 May 2026
Page 2 of 2

13

Schedule

14

Certificate Number SGS25ATEX0100X

15 Description of Product

The Vapor Hose Sensor is a proximity sensor designed to detect the opening and closing of a poppet valve in a vapor recovery coupler on road fuel tankers.

The Vapor Hose Sensor comprises a printed circuit board (PCB) containing two reed switches with a diode connected in series, enclosed in a cylindrical housing made of aluminium alloy 6061-T6 or stainless steel. The housing is filled with epoxy for mechanical robustness only.

The sensor is actuated by a magnet attached to the poppet valve and is intended for connection to intrinsically safe outputs via a permanently connected cable fitted with a 3-position plug at the end. Pins 1 and 3 of the plug are electrically connected to the intrinsically safe circuit of the equipment. Pin 2 of the connector is electrically connected to the equipment's grounding terminal and has no connection to the intrinsically safe circuit.

Intrinsically Safe parameters (pins 1 and 3):

$$\begin{aligned} U_i &= 58V \\ I_i &= 16mA \\ P_i &= 120.7mW \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

16 Report Number

GB/SGS/ExTR25.0183/00

17 Specific Conditions of Use

- The sensor housing may be made of aluminium alloy, therefore, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

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	Protection against other hazards
1.2.8	Overloading of equipment (protection relays, etc)
1.4.1	External effects
1.4.2	Aggressive substances

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
101000016APP	1 of 1	B	3/5/26	Approval Drawing Sensor Assy, Vapor hose

The above drawings are associated with Certificate No. IECEx SGS 25.0050X Issue 0.



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.



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
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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:

Vapor Hose Sensor

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

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

SGS Fimko Oy Notified Body 0598 performed an assessment to all relevant ATEX directive standards and issued certificate SGS26ATEX0100X

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

Specific Conditions of Use

- The sensor housing may be made of aluminum alloy, therefore, care should be taken to protect it from impact or abrasion if located in a zone 0 area.

Date and Place of Issue: 25 August, 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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August 2026



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