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Scully Technical Manual

ST-15C Series Single Point Overfill Protection System

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Notes:

GENERAL

The ST-15C is a single point overfill prevention (or liquid level detection) Control Unit. Single point means that it can monitor only one Scully liquid level sensor and provides a relay output and a visual indication of the sensor status, dry or wet.

This control unit is used at loading terminals for overfill prevention on single compartment vehicles (tank trucks or rail cars). In most of these applications, volume to be loaded into a compartment is pre-set via a pre-set meter. Under normal loading operations the pre-set meter shuts down the loading after the pre-set volume is loaded. The liquid does not reach the overfill sensor as it is set at a level higher than the rated capacity of the tank. However, if the liquid level goes above the rated capacity and reaches the overfill sensor, ST-15C Overfill Prevention System detects the overfill condition and signals for shutdown of loading. Thus, it acts as a secondary (emergency) shutdown system, primary shutdown control being provided by the pre-set meter.

It is typically used for overfill prevention on bottom loading or top loading vehicles. It is mounted at the loading rack/gantry and connects to a vehicle via a Scully plug and cable assembly.

The system incorporates Scully's unique and exclusive Dynacheck® concept. To ensure that it will always detect an overfill condition, the controller uses pulsed signals which continuously check the entire system operation including the controller, wiring connections and sensors. If the sensor comes in contact with liquid, or in the unlikely event of a system fault, the pulsed signals cease and the controller automatically signals for immediate shutdown of the loading operation.

The ST-15C uses intrinsically safe voltage and current to connect to Scully liquid level sensors and provides control for external electrical devices by opening and closing relay contacts.

Scully loading rack overfill protection monitors have been carefully engineered to provide reliable and safe performance when installed in conjunction with related Scully equipment according to the instructions in this manual. Adaptations of, and additions to this equipment such as the use of multiple cables and plugs, loading arm position indicating switches, enclosure heaters and similar peripheral devices may void warranties unless authorized in writing by Scully Signal Company. Please contact Scully prior to performing any installation or maintenance not specifically described in this manual.

1.1 Description

The ST-15C Control Unit interfaces with one of the following Scully liquid level sensors:

- SP-BLUK Thermistor Sensor (for light or dark liquids)
- SP-BLHK Heated Product Thermistor Sensor (for liquids loaded at high temperature)
- SP-TO, SP-IO and SP-IR Series 2-Wire Optic Sensors (for light and clear liquids)

If a sensor detects liquid, the ST-15C will respond to this "wet" condition; output relay contact opens and red light turns on. Although its typical application is monitoring sensor mounted on a vehicle it can also be used for liquid level detection in storage tanks (tank farms).

The ST-15C Control Unit is also used with Scully's portable (cane) sensors that employ one of the sensors listed above.

ST-15C is also used with vehicles equipped with Scully's IntelliCheck® series or ONBOARD Overfill Prevention Monitors. It interfaces with thermistor or 2-wire optic socket on these vehicles.

The Control Unit has an explosion proof enclosure for mounting in locations that are classified as hazardous.

1.1.1 Model Designations

The ST-15C 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-15C-120 EL	Single-Point Controller in Explosion-proof Enclosure with Indicator Lights, 120VAC
ST-15C-120 ELK	Single-Point Controller in Explosion-proof Enclosure with Indicator Lights and Key-lockable Bypass Switch, 120VAC
ST-15C-240 EL	Single-Point Controller in Explosion-proof Enclosure with Indicator Lights, 240VAC
ST-15C-240 ELK	Single-Point Controller in Explosion-proof Enclosure with Indicator Lights and Key-lockable Bypass Switch, 120VAC

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	Sensor is dry and the circuit is functioning properly. Controller output is in permissive state i.e. permit to load.
OFF	ON	Sensor is wet or faulty or no connection to sensor, or the circuit is malfunctioning. 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 "dry" sensors 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 overfill protection.

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 controller and sensor are DISABLED and the system does not provide overfill protection.

1.1.5 Indicator Light on Control Module

A L.E.D. light is mounted on the ST-15C module, inside the housing (see Figure 1). This LED flashes ON-OFF when a dry, operational sensor is connected to the unit. This flashing LED indicates the Dynamic Self-checking® or Dynacheck® operation of the control system. If the LED does not light under these conditions, the ST-15C module could be defective.

1.1.6 Control Outputs

All models of the ST-15C provide volt free, normally open contact for controlling the loading rack (gantry) valve or pump. The contact is rated at 250VAC at 5 Amps. resistive. The contact is protected by a 5A-fuse (F2) in the controller. If the controlled circuits exceed these ratings, external power relays or motor starters must be used.

1.1.7 User Replaceable Fuses

The ST-15C contains two user replaceable fuses; a 1-Ampere main fuse (F1) and a 5-Ampere control fuse (F2) (see Replacement Parts Sheets in Appendix 4.0).

1.2 Technical Specifications

Temperature Range:	-20°C to +60°C (-4°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
Sensors:	One of the following sensors: SP-BLUK Series Thermistor Sensor (-40°C to +48°C) SP-BLHK Series Thermistor Sensor (-28°C to +93°C) SP-TO, SP-IO OR SP-IR Series 2-Wire Optic Sensor (-40°C to +60°C)
Output Relay:	One normally open volt-free contact rated 250VAC, 5A resistive max. The output contact closes when all sensors are dry and functional.
Response Time:	PERMISSIVE: Output goes permissive in 6 to 30 seconds (typical) of connection to a thermistor sensor (warm-up time of thermistor). Output goes permissive instantaneously when connected to an optic sensor. NON-PERMISSIVE (shutdown): 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 4.0 for outline drawing
Weight:	12.7 Kg (28 Lbs.)

Approvals:	Baseefa02ATEX0048 Ex d e mb IIB T5(T_{amb} -20°C to +60°C) Gb or Ex d e mb IIB T6 Gb The enclosure contains associated electrical apparatus to Baseefa02ATEX0169U [Ex ia] IIB (T_{amb} -40°C to +70°C) Gb

Degree of protection of enclosure IP65. 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-15C 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-15C may only be repaired by replacing the internal control module. The internal control module is non-repairable.

Do not open when an explosive gas atmosphere is present.

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-15C Control Unit to the vehicle. Plug and cable assemblies are available with various plugs conforming to industry standard configurations and with coiled or straight cables in various lengths.

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-15C 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

The following model is needed to make connection to a vehicle. The selection is based on the style of socket used on the vehicles. "B" style plugs connect to "B" style sockets (i.e. 4 J-slots).

Model	Description
SC-8B	Sculcon Junction Box with 8B Green Plug & Cable. The 8B style plug has 4-bayonet pins (for attachement to vehicle socket) and 10 contact pins. The SC-8B is available with either a 9-meter Coiled Cable (P/N 08677) or 6-meter Straight Cable (P/N 09162) configuration.

Consult factory for additional models.

INSTALLATION

The ST-15C 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-15C 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 4.0 for installation.)

Refer to the Outline Drawing in Appendix 4.0 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 4.0.

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 sensors, via a Scully Sculcon Junction Box and Plug & Cable.

WARNING The electrical cable entry in the bottom of the enclosure marked "INTRINSICALLY

SAFE ENTRY" must only be used for wiring to the sensors (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 enclosure. Connect mains power wires to appropriate terminals on 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-15C Control Module is protected by a 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 (1.5mm^2 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 sensor connected to the control unit is dry and functional (or when optional bypass switch is in the "Bypass" position).

The contact opens if sensor gets wet (i.e. detects liquid). The contact also opens in case of a fault in the sensor, wiring to the sensor or a fault within the control units' circuitry.

NOTE: An internal 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 4.0.) 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-15C'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-15C 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 1.5mm^2 (18AWG) minimum conductor size. Connect wires to Sculcon as shown in the Wiring Diagram in Appendix 4.0. 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.

There is a factory installed jumper on TB2 terminals 1 and 2. Remove the jumper if the control unit is

to be used with Scully's SP-BLHK heated product sensor. Otherwise, the jumper must be kept in place.

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 Model ST-2-CBE Series Tester to perform the commissioning tests as described below. The tester will expedite the initial system checkout of the ST-15C. While not required, the tester provides all of the proper overfill prevention system signals to verify the new installation without the need to secure an actual vehicle for testing.

2.3.2 Operational Testing

Apply power to the ST-15C control unit.

The red light should be ON, provided Bypass Control Switch is in NORMAL position.

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

- NORMAL: Red light should be ON
- BYPASS: Both lights should be OFF

Set Bypass Switch to NORMAL position, the normal operation setting. The Bypass Switch should be kept under a lock (user provided) so that its' setting cannot be tampered with.

Connect Sculcon plug to socket on the tester. Follow instructions provided with the tester.

The tester is capable of checking controllers that can monitor up to 8 Scully sensors (2-wire thermistor or Optic Sensors). As ST-15C is a single point controller (monitors only one sensor) the tester only needs to test in one of the eight positions of the selector switch on the tester. Select switch position 5 to test the ST-15C. As the tester simulates a vehicle equipped with 2-wire sensors, the ST-15C output will go permissive immediately with green light ON and red light OFF.

Follow instructions provided with the tester to test both permissive and non-permissive states of the ST-15C controller.

2.4 System Operation

Connect the Sculcon plug to socket on the vehicle to be loaded. The ST-15C controller will go PERMISSIVE immediately (i.e. green light ON). The output relay contact closes enabling the loading to begin. If there is a fault in the sensor, wiring interconnections or the controller circuitry the controller output will stay NON-PERMISSIVE (does not allow loading to begin). If a fault develops during loading or liquid level reaches the sensor, the controller will switch to NON-PERMISSIVE (i.e. red light ON and output relay contact opens).

Disconnect Sculcon plug from the socket after the loading is complete. Hang the plug on the hook provided on the Sculcon junction box (or in Scully Plug Storage Hanger socket).

MAINTENANCE

CAUTION: BEFORE PERFORMING ANY MAINTENANCE ON THE CONTROL UNIT, DISCONNECT POWER TO THE ST-15C AND WAIT FIVE MINUTES BEFORE OPENING THE ENCLOSURE. DO NOT OPEN WHEN AN EXPLOSIVE GAS IS PRESENT.

3.1 Enclosure

Considering the location where the control unit will be typically mounted, it is advisable to 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.

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 4.0).

It is also recommended to replace the cover O-ring at the same time.

3.3 Control Module (Circuit Board)

The ST-15C control unit's internal circuitry does not require any routine periodic maintenance.

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-15C 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-15C Control Module Illustration on following page)

3.4 Module Replacement

REMOVING THE MODULE

1. Remove (disconnect) power from the ST-15C Control Unit. Make sure the work area is gas vapor free.
2. To open the ST-15C 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.
5. Apply power to the Control Unit.
6. Factory installed jumper. Do not remove unless ST-15C is to be connected to a Scully Model SP-BLHK sensor.

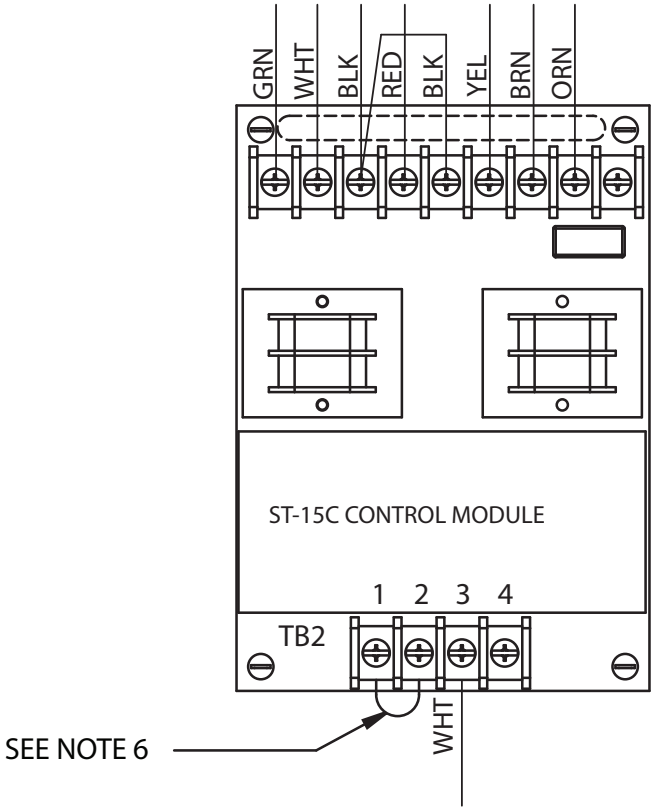


Figure 1: ST-15C Control Module Illustration

Note: The ST-15C Replacement Control Module cannot be repaired in the field. A damaged or faulty module must be replaced with an equivalent Scully ST-15C Control Module. The ST-15C Replacement Control Module must only be installed in Scully's explosion-proof enclosure. The enclosures' explosion-proof and weatherproof integrity must be maintained.

The ST-15C Control Module should not be subjected to any mechanical impact. Do not allow build-up of dust on the Control Module.

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

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 4.0. Follow instructions provided with the replacement indicator lights (pilot lights).

Note: Older ST-15C Controllers employed incandescent style lights. These require replacement of bulb if it blows. Refer to Replacement Parts Sheet in Appendix 4.0. 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 4.0 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 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-15C.

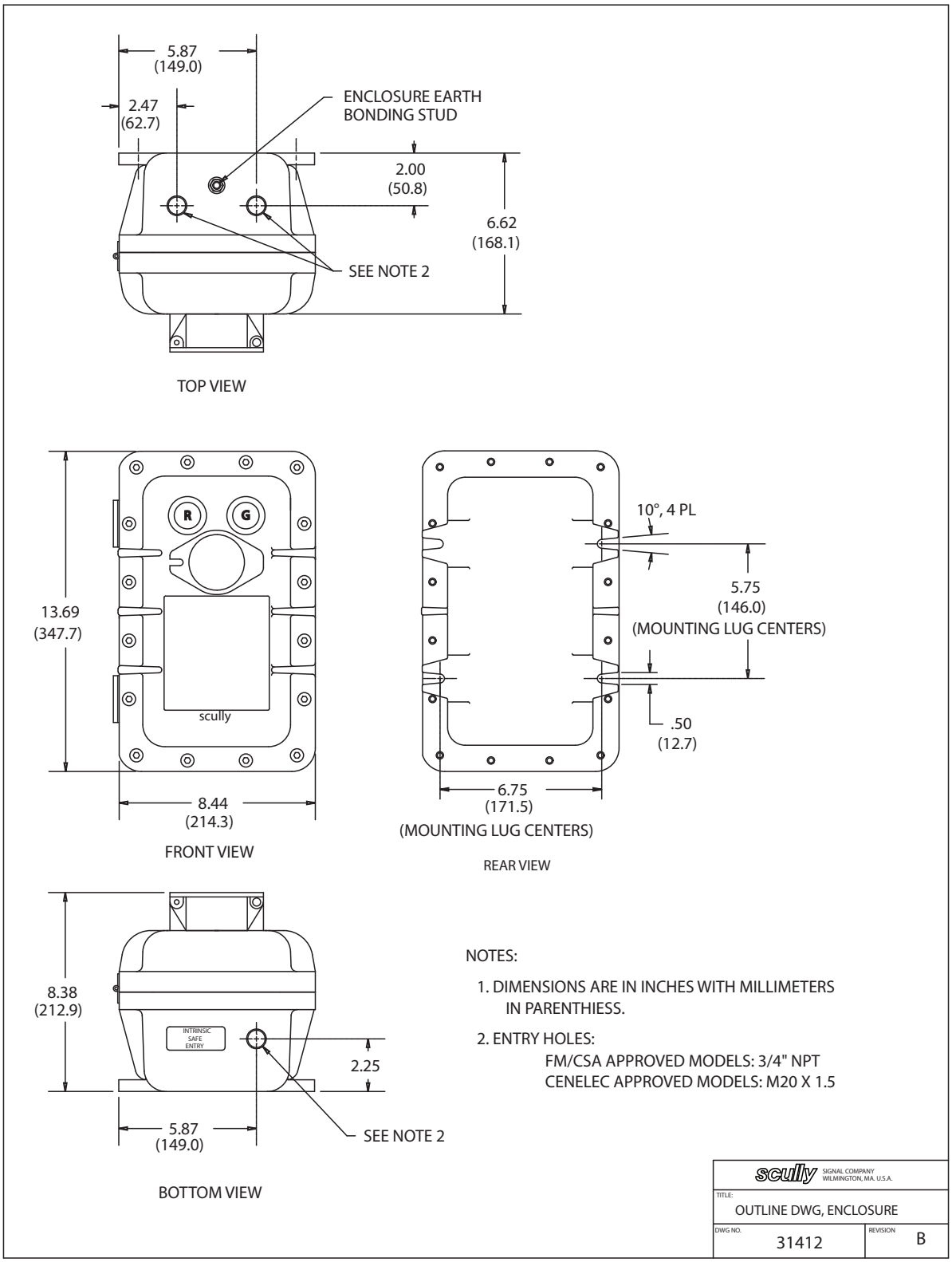
CONDITION	POSSIBLE CAUSE
No lights ON, on front cover	● No power to control unit ● Control (Bypass) Switch in OFF position ● Bulb blown (on older units with incandescent lamps) ● Input power fuse (F1) is blown ● Control Module is defective

CONDITION	POSSIBLE CAUSE
Green (Permissive) light ON, but control contact outut 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 with Scully thermistor sensor or 2-wire sensor (or Scully tester) AND/OR LED on Control Module (circuit board) not flashing ON-OFF	● Fault in wiring to junction box and/or plug ● Wet or faulty sensor on vehicle ● Fault in wiring on vehicle ● Bad plug to socket connection ● Control Module is defective

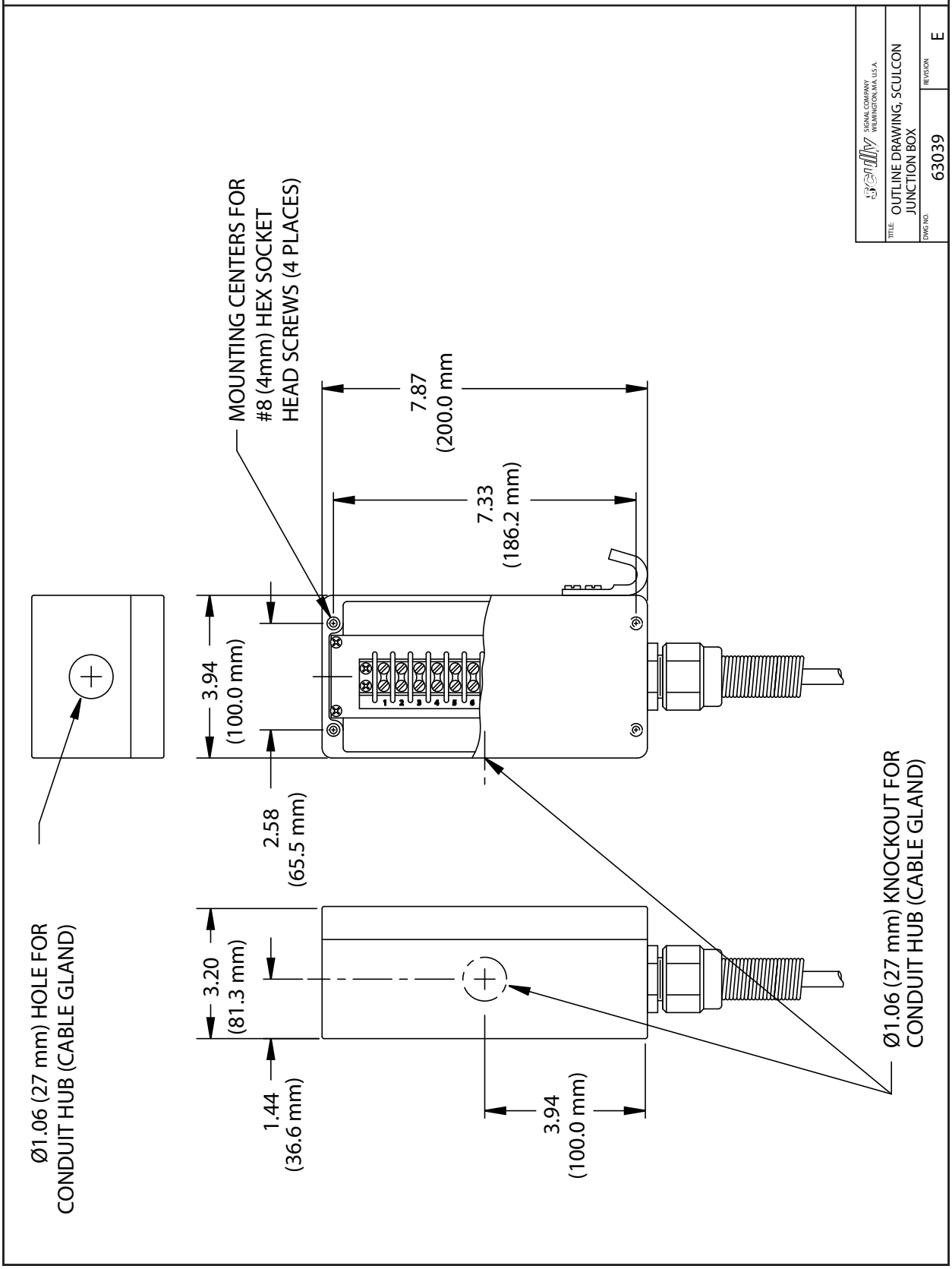
Check voltage (DC) between pins 5 and 10 (ground) of the plug. It should be 13.5VDC minimum.

APPENDIX

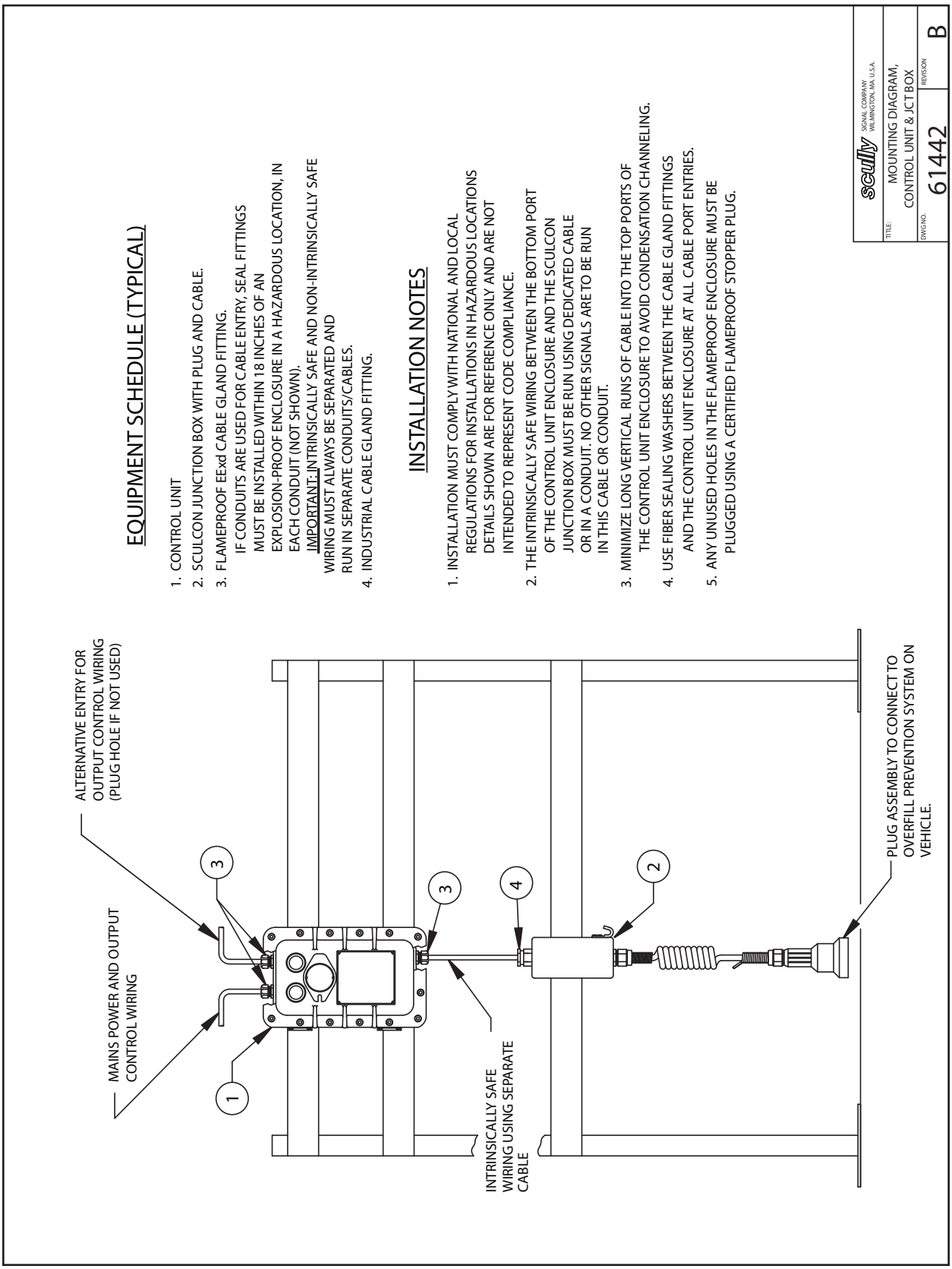
4.1 Control Unit Enclosure Outline Drawing - DWG 31412



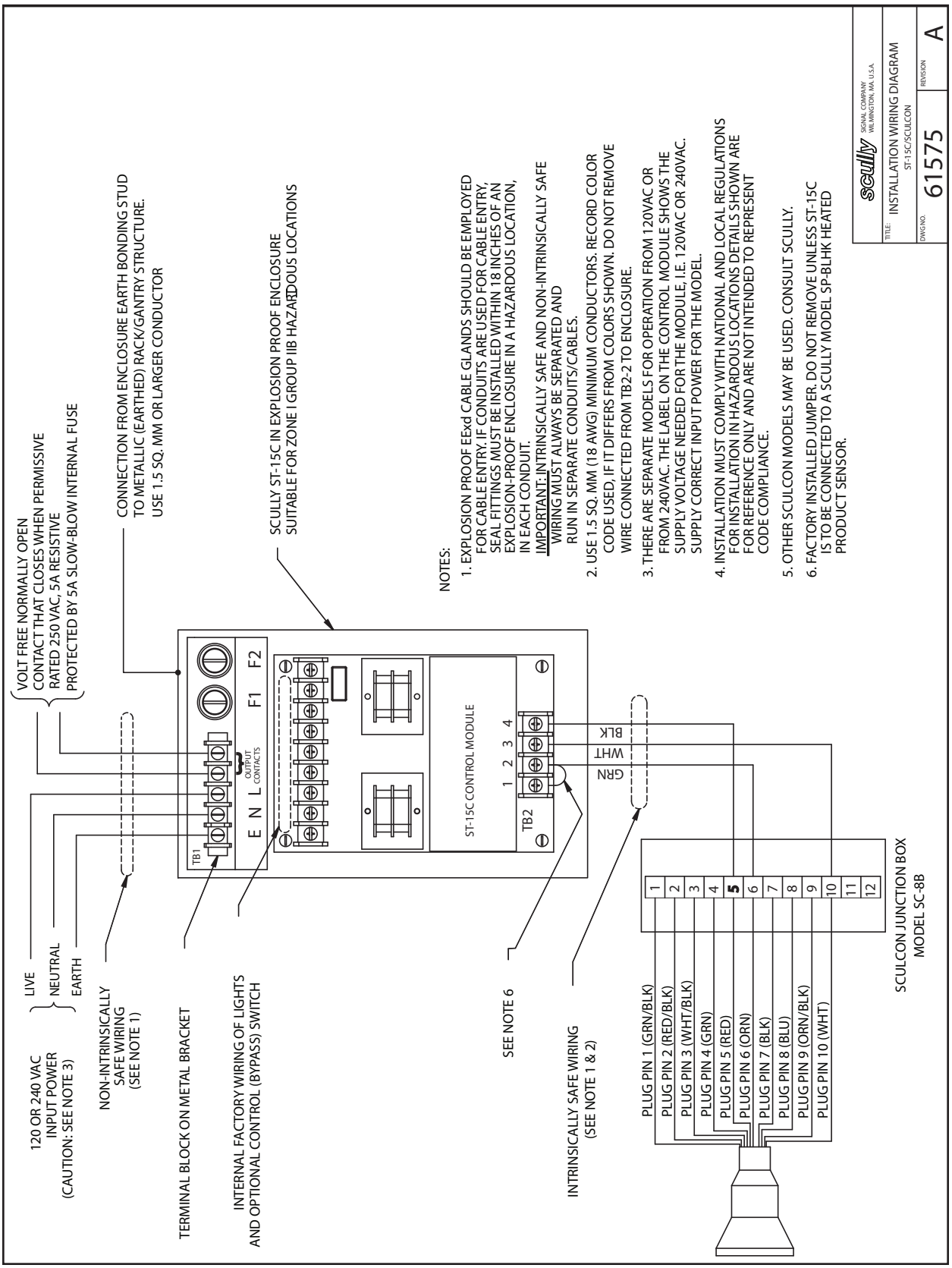
4.2 Outline Drawing - Sculcon Junction Box - DWG 63039



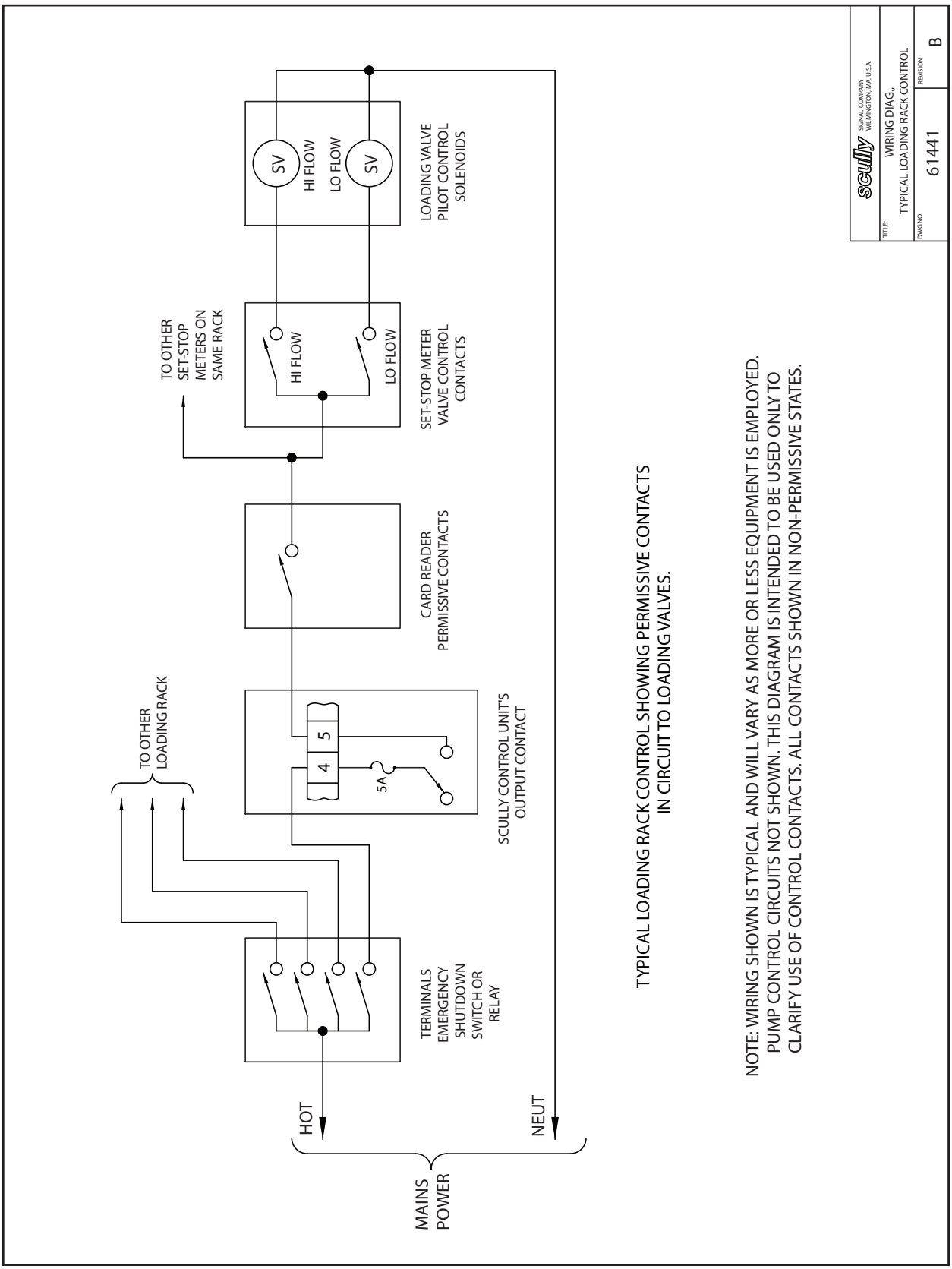
4.3 Mounting Diagram, Control Unit & Junction Box - DWG 61442



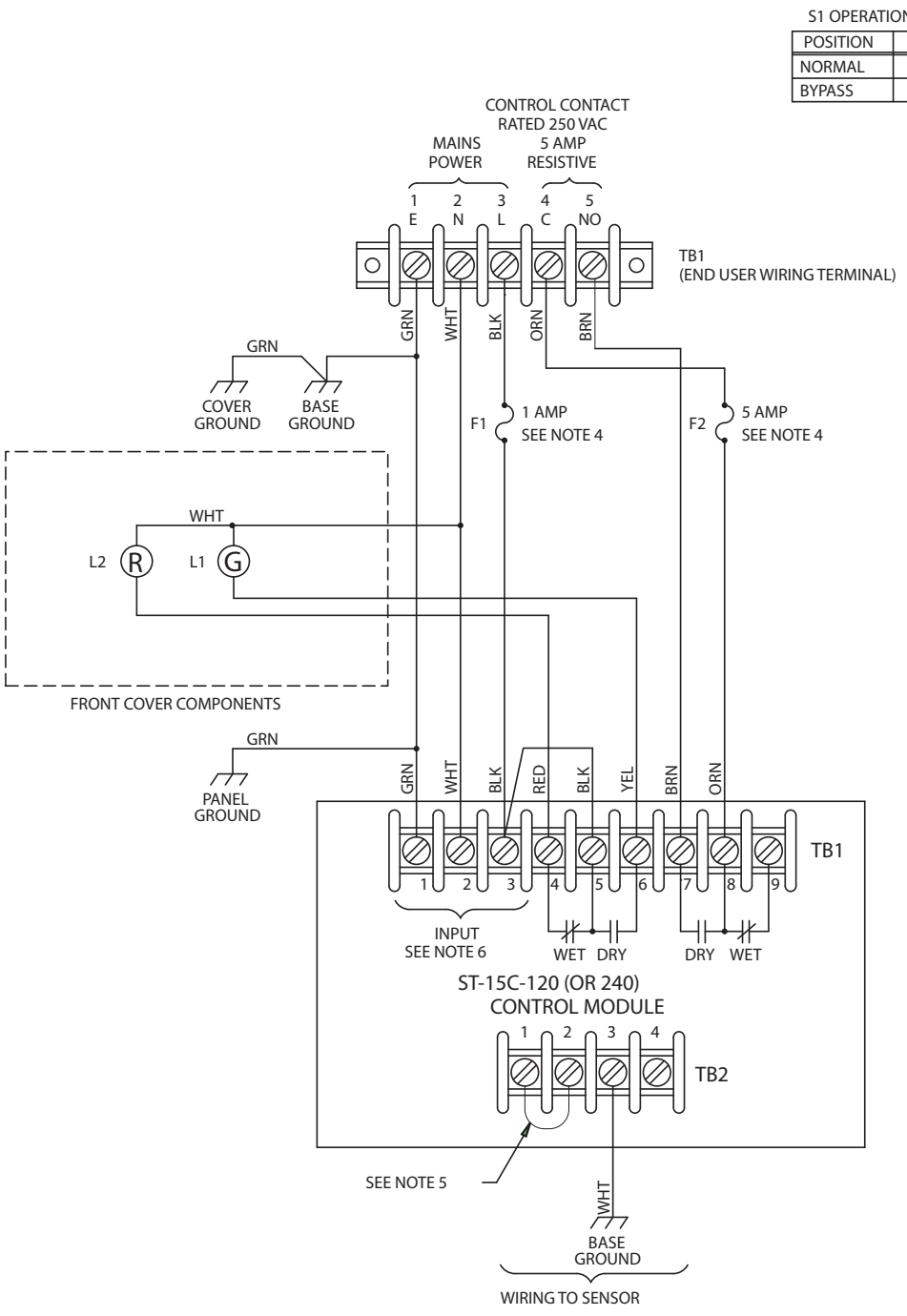
4.4 Installation Wiring Diagram - DWG 61575



4.5 Wiring Diagram, Typical Loading Rack Control - DWG 61441



4.6 Internal Wiring Diagram - ST-15C EL - DWG 31392



NOTES: UNLESS OTHERWISE SPECIFIED;

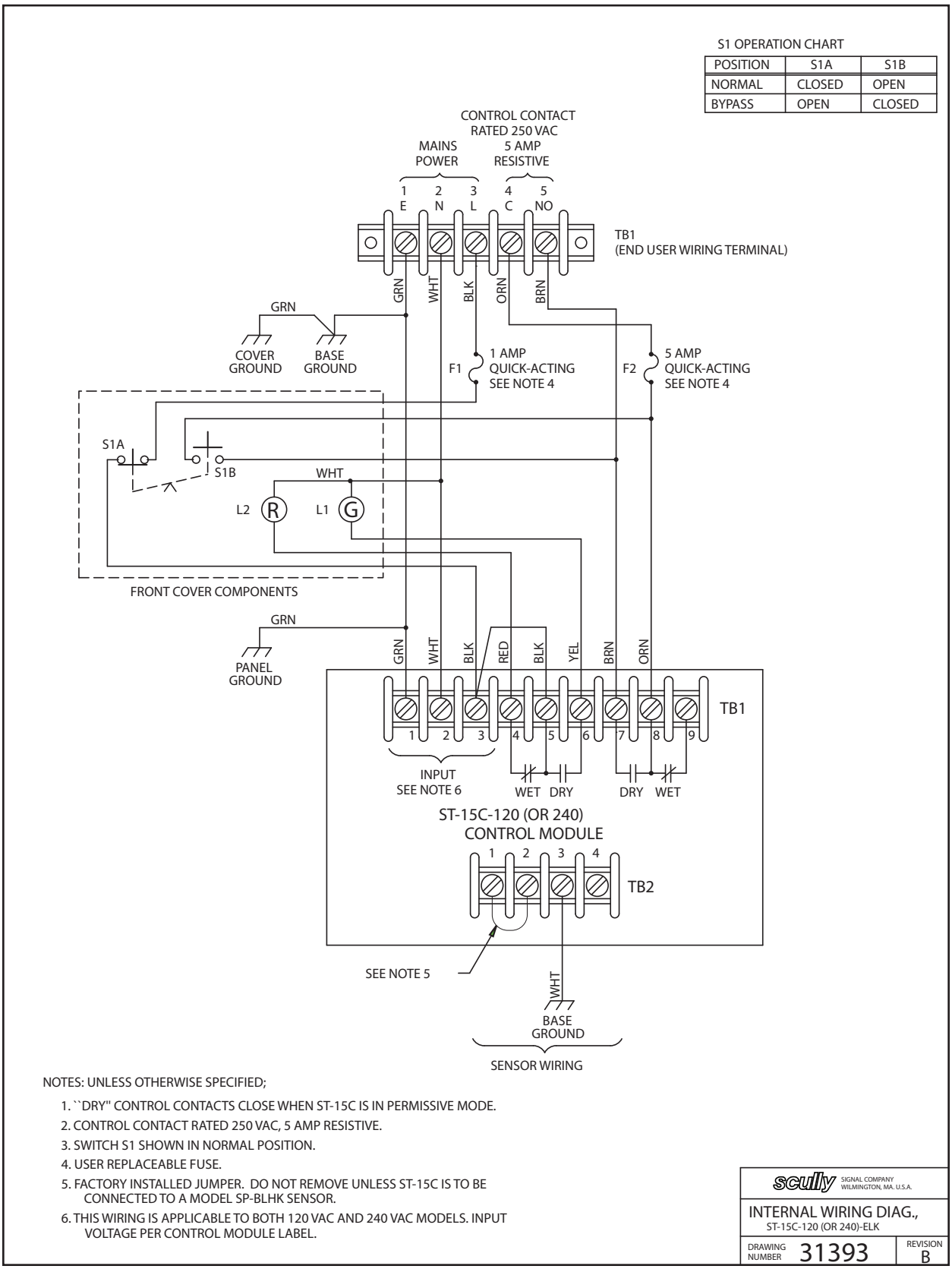
1. ``DRY'' CONTROL CONTACTS CLOSE WHEN ST-15C IS IN PERMISSIVE MODE.
2. CONTROL CONTACT RATED 250 VAC, 5 AMP RESISTIVE.
3. USER REPLACEABLE FUSE.
4. FACTORY INSTALLED JUMPER. DO NOT REMOVE UNLESS ST-15C IS TO BE CONNECTED TO A MODEL SP-BLHK SENSOR.
5. THIS WIRING IS APPLICABLE TO BOTH 120 VAC AND 240 VAC MODELS. INPUT VOLTAGE PER CONTROL MODULE LABEL.

scully SIGNAL COMPANY WILMINGTON, MA. U.S.A.

INTERNAL WIRING DIAG.,
ST-15C-120 (OR 240)-EL

DRAWING NUMBER 31392 | REVISION B

4.7 Internal Wiring Diagram - ST-15C ELK - DWG 31393



NOTES: UNLESS OTHERWISE SPECIFIED;

1. ``DRY'' CONTROL CONTACTS CLOSE WHEN ST-15C IS IN PERMISSIVE MODE.
2. CONTROL CONTACT RATED 250 VAC, 5 AMP RESISTIVE.
3. SWITCH S1 SHOWN IN NORMAL POSITION.
4. USER REPLACEABLE FUSE.
5. FACTORY INSTALLED JUMPER. DO NOT REMOVE UNLESS ST-15C IS TO BE CONNECTED TO A MODEL SP-BLHK SENSOR.
6. THIS WIRING IS APPLICABLE TO BOTH 120 VAC AND 240 VAC MODELS. INPUT VOLTAGE PER CONTROL MODULE LABEL.

scully SIGNAL COMPANY WILMINGTON, MA. U.S.A.

INTERNAL WIRING DIAG.,
ST-15C-120 (OR 240)-ELK

DRAWING NUMBER 31393 | REVISION B

4.8 Replacement Parts ST-15C 120VAC - DWG 61558

ST-15C 120VAC

Single Point Controllers

CENELEC Models

Part No.	Model
09633	ST-15C-120 EL
09631	ST-15C-120 ELK

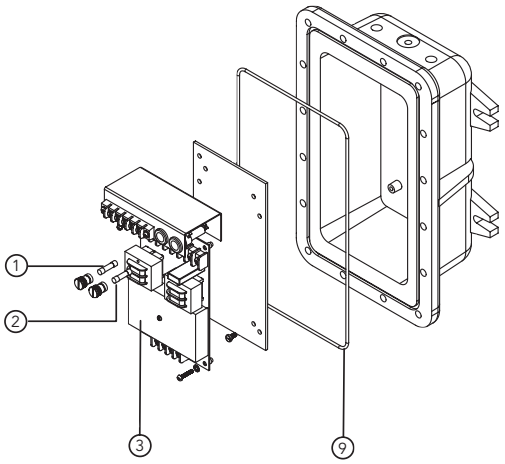
Note: Controller Models Suffix:
Explosion-proof housing (E), Indicator Lights (L), Key (K) Lockable Bypass Switch.

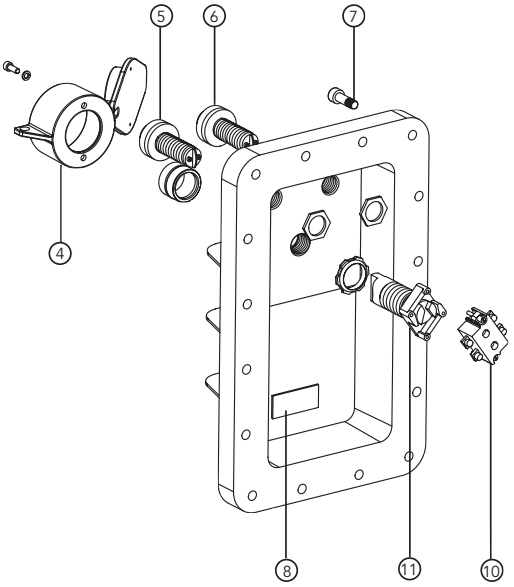
Replacement Parts

Item	Part No.	Description	Qty.
1	26343	Mains Fuse, 1 Amperes	1
2	26350	Control Fuse, 5 Amperes	1
3	08756	ST-15C-120H Module Assembly, 120V	1
4	08360	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, Stainless	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 4: New socket head screw used on models built after 10/92.
Item 7: O-ring used on models built after 10/92.
Item 8, 9: LED style lamps used on models built after 9/01.

* Replacement bulb for incandescent style explosion-proof lights only and models built prior to 7/01.





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4.8 Replacement Parts ST-15C 240VAC - DWG 61272

ST-15C 240VAC

Single Point Controllers

CENELEC Models

Part No.	Model
08633	ST-15C-240 EL
08631	ST-15C-240 ELK

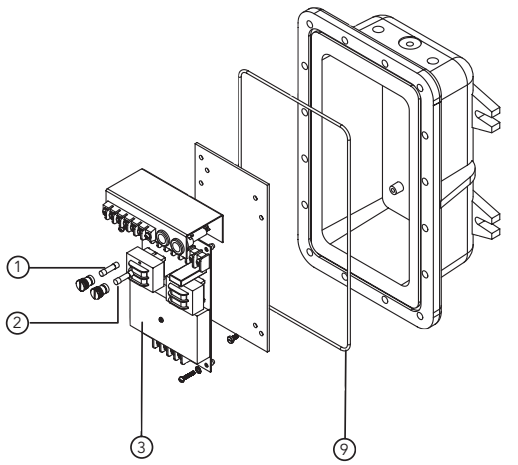
Note: Controller Models Suffix:
Explosion-proof housing (E), Indicator Lights (L), Key (K) Lockable Bypass Switch.

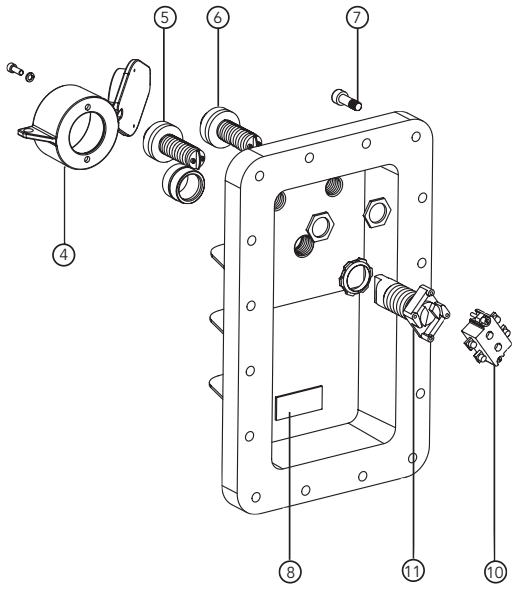
Replacement Parts

Item	Part No.	Description	Qty.
1	26343	Main Fuse, 1 Amperes	1
2	26350	Control Fuse, 5 Amperes	1
3	08656	ST-15C-240H Module Assembly, 240V	1
4	08360	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, Stainless	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*	1

Note:
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 7/01.

* Replacement bulb for incandescent style explosion-proof lights only and models built prior to 7/01.





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Notes:

Scully Signal Company, an engineering and manufacturing company established in 1936, is a brand name in the transportation and storage of petroleum and liquid chemicals. Our core Systems include: Overfill Prevention, Retained Product Monitoring, Vehicle Grounding and Verification, Level Alert Notification, and Vehicle to Terminal Communications. Scully is also making technological advancements in remote fuel site communications and automated fueling systems.

Our employees service the needs of Scully's global customers in a wide range of markets. In addition to its headquarters in Wilmington, Massachusetts, Scully has direct sales offices in England, Europe and throughout the world. Scully is represented in over 60 countries and is ISO 9001 Certified. For more information, call Scully Signal Company at 800.2.SCULLY (800.272.8559), or visit www.scully.com.

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SYSTEMS

ISO 9001 scully REGISTERED COMPANY

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