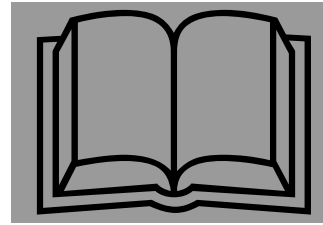


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**UT-ID 1.1.14.0-6**

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Technical Information for  
AUT-O-SAFE® Emergency Rescue Unit  
(ERU)

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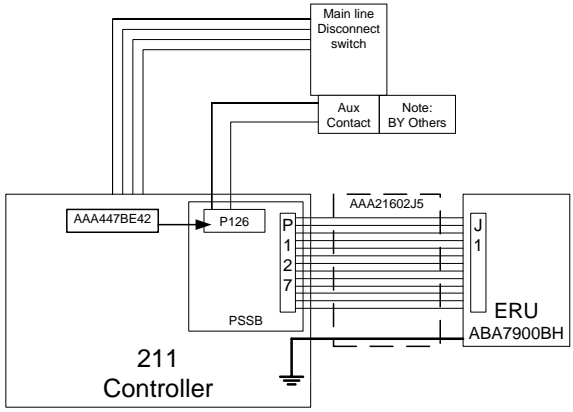
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## Description

This document contains installation instructions and initial power on testing instructions for the ABA7900BH1 or ABA7900BH2 AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU). ERUs are designed for use with the two versions of the 211 hydraulic elevator control system. The associated electrical schematic diagrams are A\_A21241L and A\_A21241V. The instructions are also included for older hydraulic elevators that conform to the 7900AT and 7900AS electrical diagrams. Table 1 lists the parts required when installing an ERU. Each set of materials includes: (1) AUT-O-SAFE unit based on door operator voltage, depending on hydro model, (1) serial wire harness, and (1) P126 plug.

**NOTE:** Please pay attention to comments in Table 1.

**Table 1: Parts List**

Description	Part No.	Comments
AUT-O-SAFE <sup>®</sup> Arrangement 1	ABA7900BH1	Used for E211M microprocessor hydraulic elevators equipped with 100 VDC (nom) door operator motors.
AUT-O-SAFE <sup>®</sup> Arrangement 2	ABA7900BH2	Used for E211M microprocessor hydraulic elevators equipped with 200 VDC (nom) door operator motors; for example, the GAL door operator motors.
Serial Wiring, 44 Foot Length	ABA21602J5	Cable harness used to make electrical connections to ERU and from controller 211 power supply board (PSSB). Equipped with P127 (AAA447BE41) connector.
P126 (Plug)	AAA447BE42	Connects to PSSB P126 main line disconnect. Used to connect auxiliary contact (closed when main line disconnect switch is closed), as required when P126 is present on (PSSB) board.
18 Gauge Wire		As required for installations with no P127 connector or older hydro controllers.
Application of the AUT-O-SAFE on the 211 Controller		

## Required Tools

- Multimeter
- Lock out and tag out equipment
- Hand tools as required to complete installation.

## Additional Parts Required

An auxiliary contact (not supplied by UNITEC) **must** be installed adjacent to the main line disconnect switch. This switch is required to prevent the elevator from rescuing each time the main line disconnect switch is turned off. The leads from this switch may be piped to the controller (with P126 & P127 on the PSSB board) or directly to the AUT-O-SAFE<sup>®</sup> unit, depending on the application/controller. The contacts should be **closed** when the main line disconnect switch is **ON**.

## Optional Tools/Parts

- (1) Ferrule tool, UNITEC p/n AAA27EF9
- (10) Yellow 18 AWG ferrule, UNITEC p/n AAA378D3
- (4) Blue 14 AWG ferrule, UNITEC p/n AAA378D5

**NOTE: Read all the instructions prior to starting installation process.**

## AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU) Installation Instructions

### A\_A21241V Diagram – 211, with Plug 127

1. An auxiliary contact (not supplied by UNITEC) must be installed at the main line service disconnect switch before installing an ERU. The contact must be closed when the disconnect switch is ON (refer to Figure 5).

**CAUTION:** Lock out and tag out the main line disconnect before making any connections to the controller or the main line. Test and verify.

2. Refer to Table 2. Wire connection must be made from the main line service disconnect auxiliary contact to P126 on the PSSB in the hydro controller (see Figure 5). A UNITEC p/n AAA447BE42 connector is required to plug into P126 on the PSSB.

3. Mount the ERU as desired.

**NOTE:** Verify the batteries are not connected at this time. Make certain the P1 plug connector is properly plugged into the ERU board. The “118” end of the ERU connector plug should line up with pin 1 at the bottom end of the printed circuit board header (J1.) Conduit should be used to run the 14 conductor 18 gauge multi-cable wires from controller to ERU, follow local electrical code.

4. Locate the ABA21602J5 “controller to emergency return unit” cable assembly that is part of the required erection equipment. This assembly consists of 13 numbered and colored wires inserted into an AAA447BE41 connector, plus a separate green/yellow wire. Insert the connector portion of the cable assembly into the P127 connector that is located on the PSSB in the hydro controller. The “259” end of the multi-colored connection should line up with pin 1 at the top end of the printed circuit board connection P127.
5. Remove the four “NO ERU” jumpers on the PSSB. The jumpers to be removed are located between J20 and J19, J9 and J10, J52 and J53, and J51 and J50.
6. Route the 14 numbered wires through the conduit from the hydro controller to the ERU. Follow hookup instructions per Table 2.

**NOTE:** None of the connections are interchangeable.

7. The batteries should be installed in the bottom of the ERU enclosure after all other wiring is completed. Connect batteries per the wiring label on the inside of the enclosure.
8. Update software using the on-board service display and controls. Refer to software section of this document to enable ERU operation.

TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Table 2: Hookup Instructions for A\_A21241V Diagram – 211

Wire Number	Wire Color and Size	Hydro Controller PSSB Connector (P127) or Ground Stud	ERU Connector (PCB Header J1 with Plug P1)	Signal Name	Figure #
259	Red, 18-Gauge	P127-1 (259)	P1-1	VAC2	1
258	Red, 18-Gauge	P127-2 (258)	P1-2	VAC1	1
257	Red/White, 18-Gauge	P127-3 (257)	P1-3	VACC	1
256	Red/White, 14-Gauge	P127-4 (256)	P1-4	DRC	2
255	Red, 14-Gauge	P127-5 (255)	P1-5	DR2	2
254	Red, 14-Gauge	P127-6 (254)	P1-6	DR1	2
253	Brown/White, 18-Gauge	P127-7 (253)	P1-7	30VC	3
252	Brown, 18-Gauge	P127-8 (252)	P1-8	30V2	3
251	Brown, 18-Gauge	P127-9 (251)	P1-9	30V1	3
250	Brown, 18-Gauge	P127-10 (250)	P1-10	ER3	4
249	Brown, 18-Gauge	P127-11 (249)	P1-11	ER1	4
248	Red, 18-Gauge	P127-12 (248)	P1-12	DIS2	5
247	Red, 18-Gauge	P127-13 (247)	P1-13	DIS1	5
			P1-Unmarked		
3	Green-Yellow, 14-Gauge	Ground Stud in Controller	Ground Stud in ERU	GROUND	6

## Wire Diagram Figures for A\_A21241V Diagram – 211

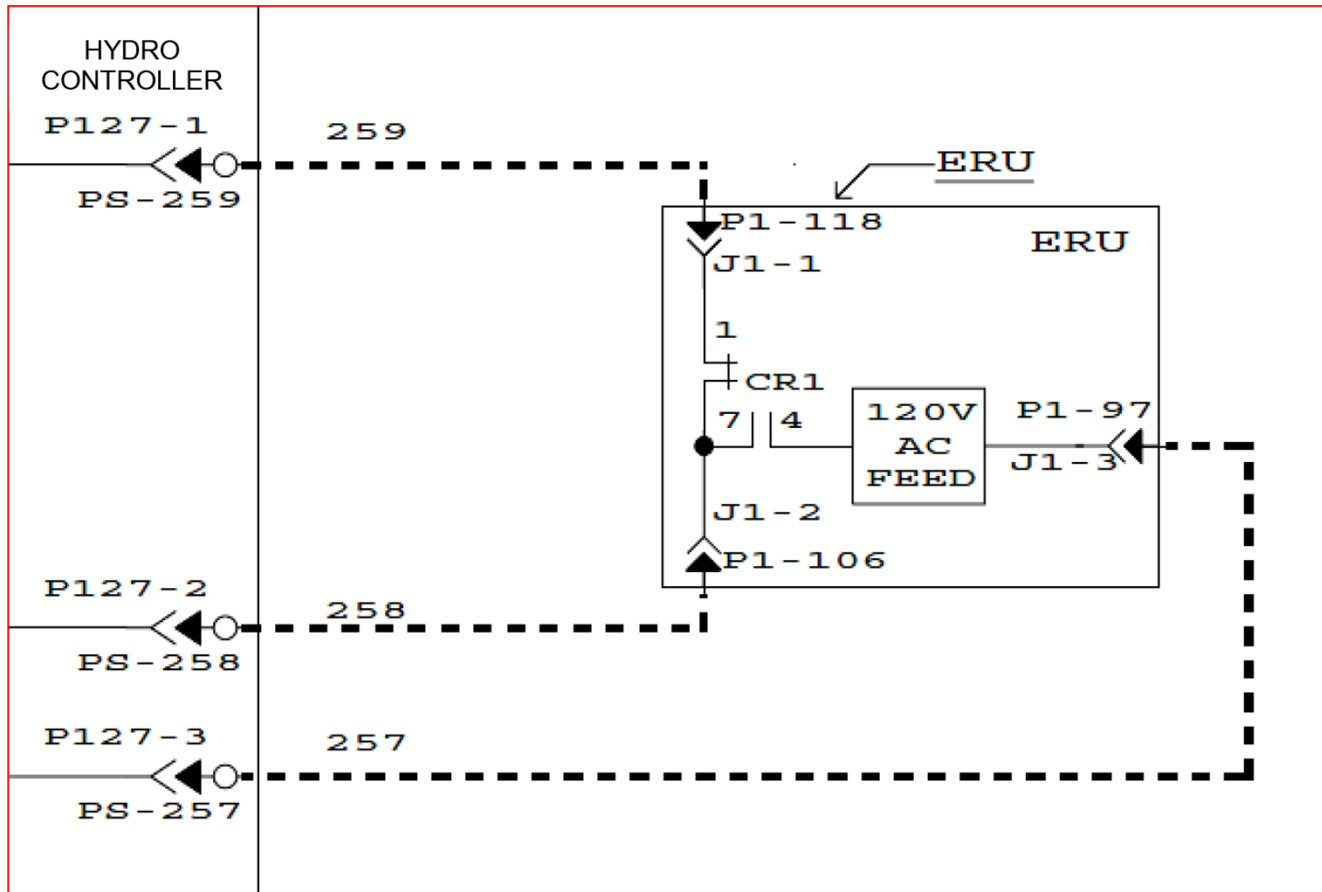


Figure 1: Pins 1, 2, 3

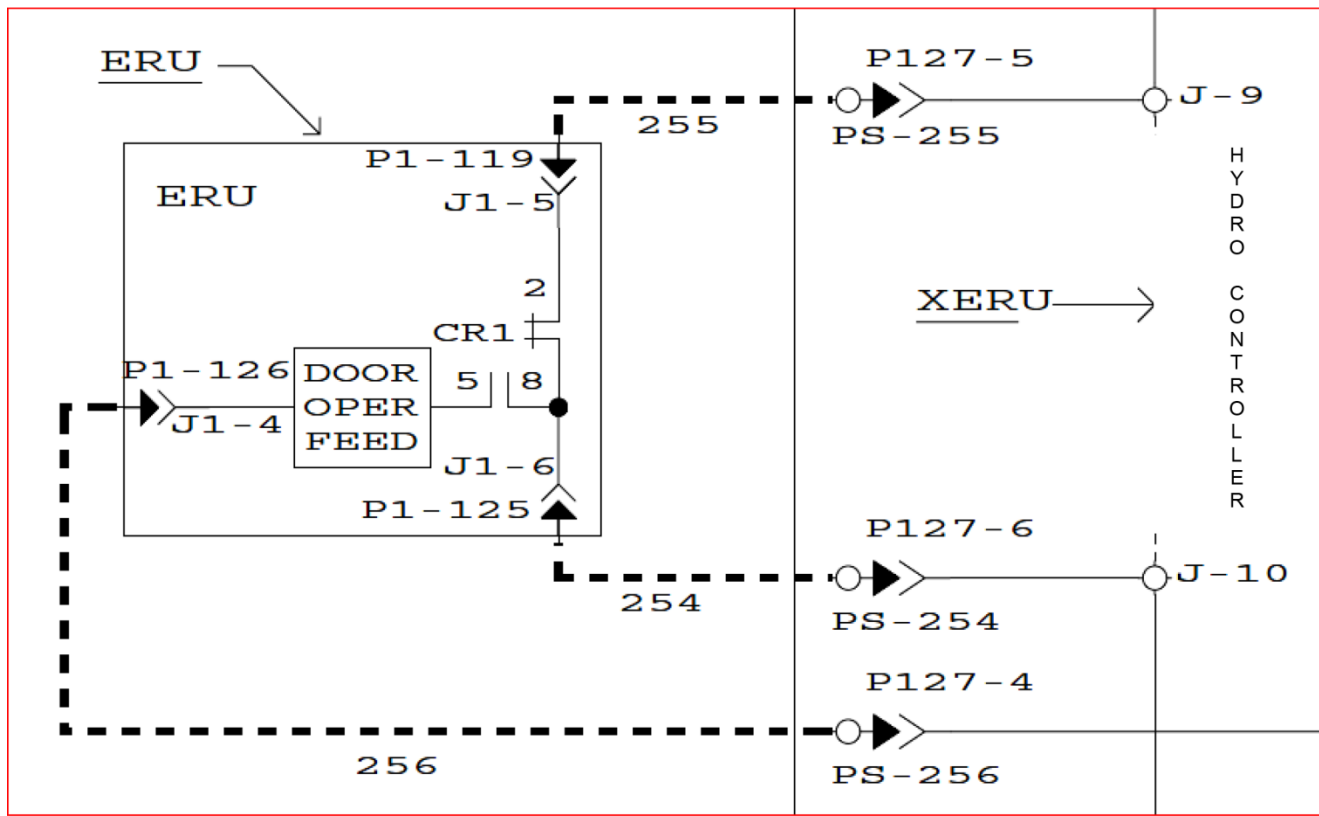
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 2: Pins 4, 5, 6



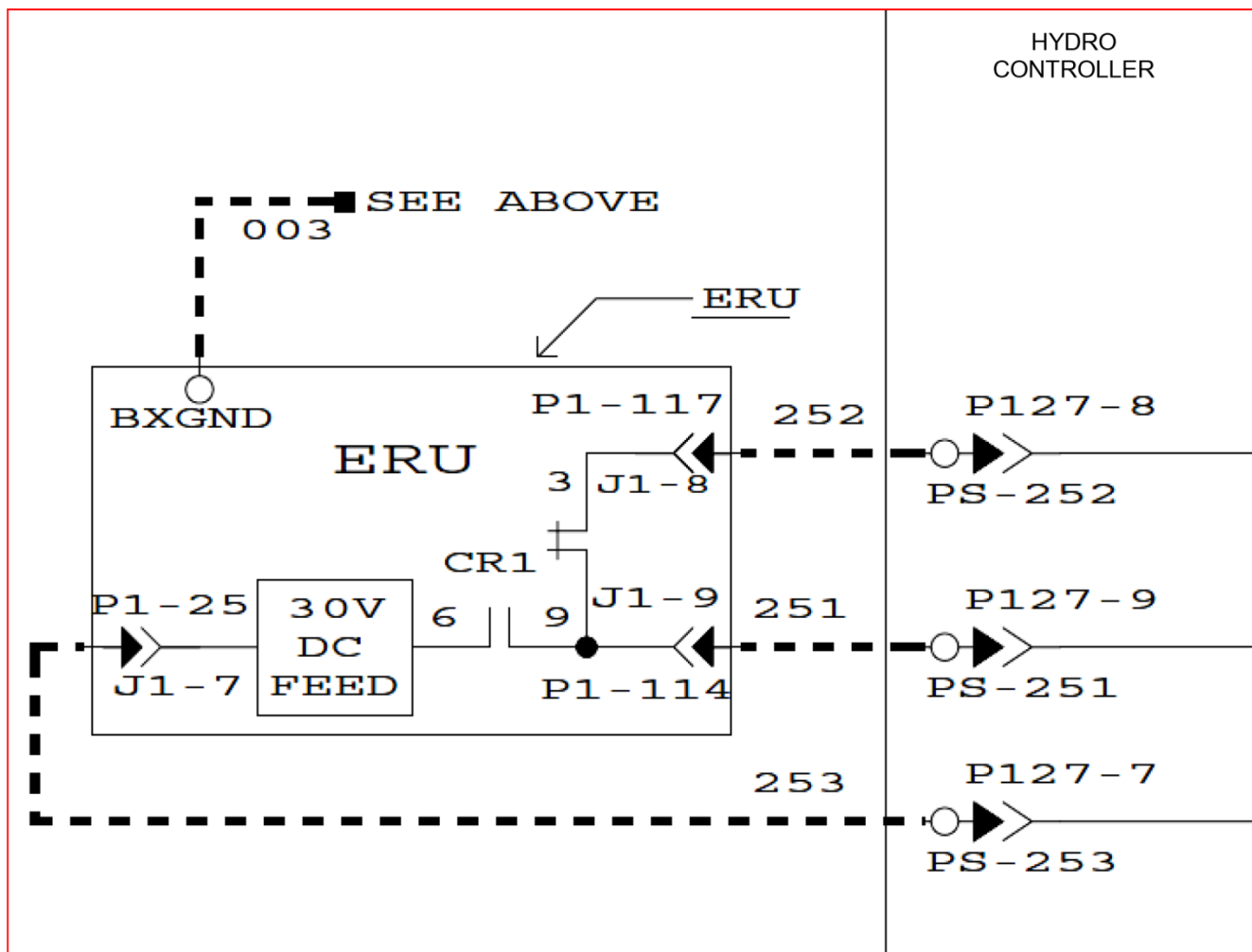
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 3: Pins 7, 8, 9

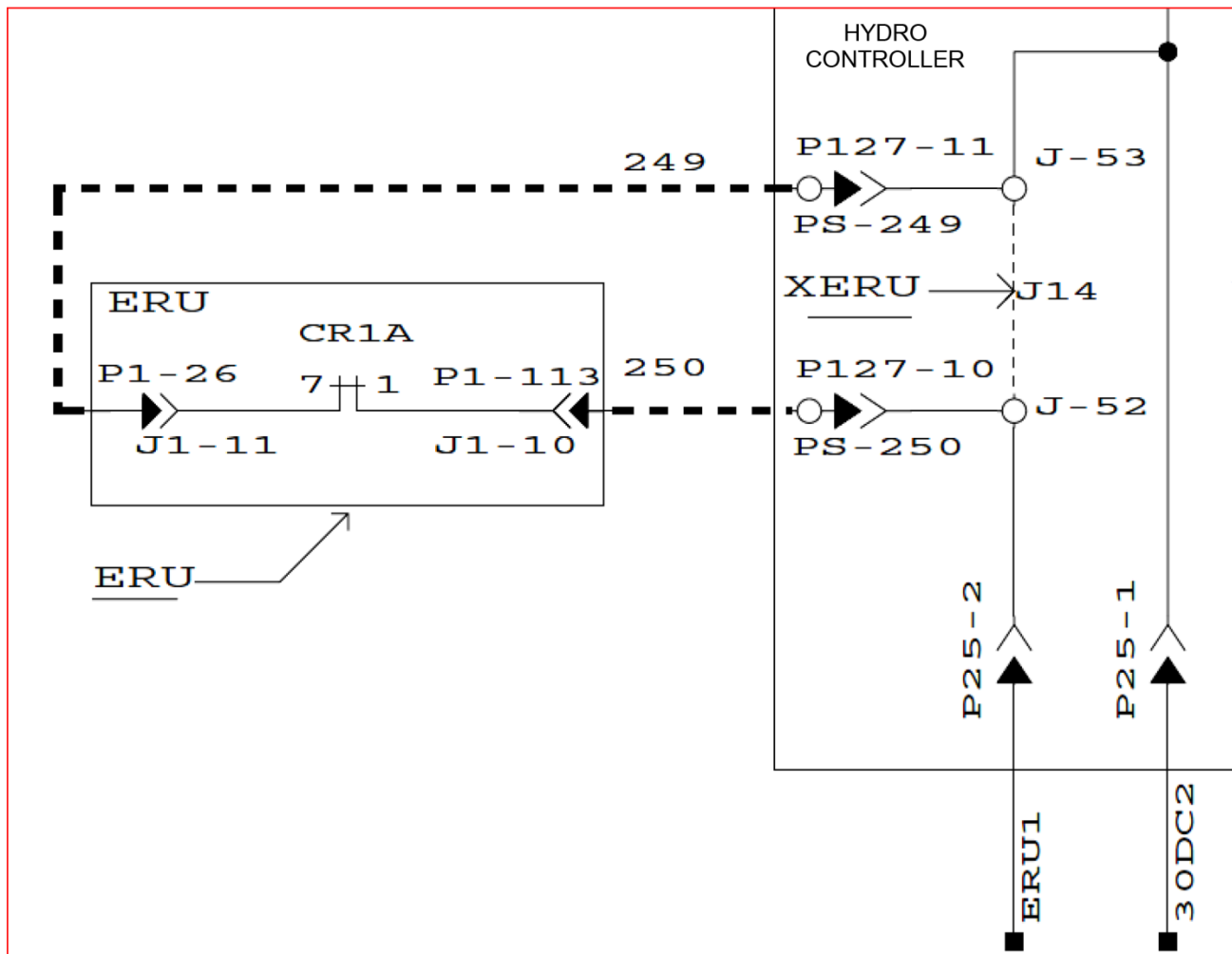
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 4: Pins 10, 11

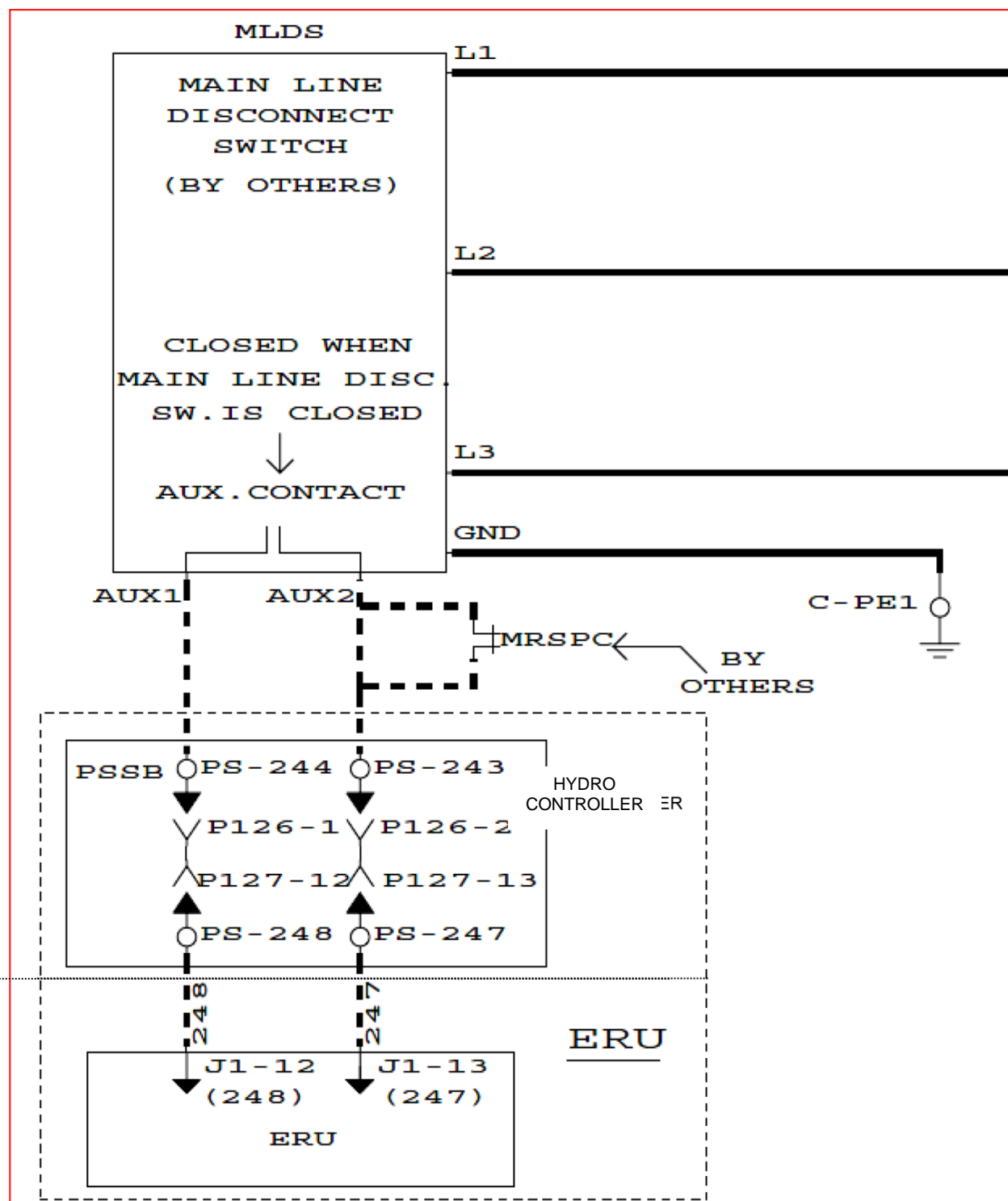


Figure 5: Pins 12, 13

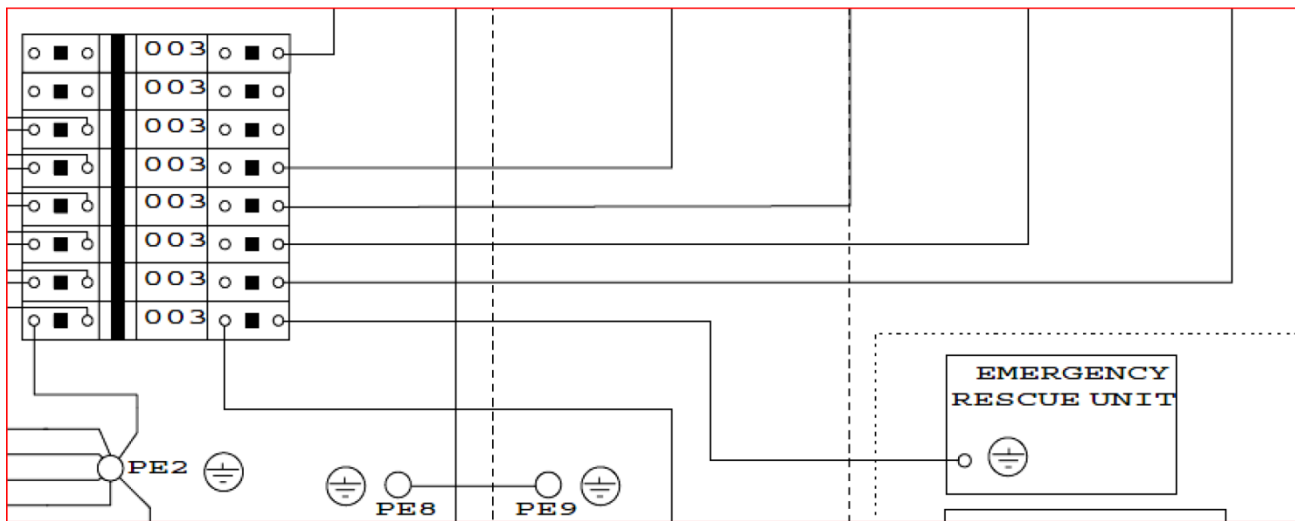
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 6: Ground Stud in ERU

## **AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU) Installation Instructions**

### **A\_A21241L Diagram – 211, Without Plug 127**

1. An auxiliary contact (not supplied by UNITEC) must be installed at the main line service disconnect switch before installing the ERU. The contact must be closed when the disconnect switch is ON.

**CAUTION: Lock out and tag out the main line disconnect before making any connections to the controller or the main line.**

2. Mount the ERU.

**NOTE:** Verify the batteries are not connected at this time. Make certain the P1 plug connector is properly plugged into the ERU board. The “118” end of the ERU connector plug should line up with pin 1 at the bottom end of the printed circuit board header (J1). Conduit should be used to run the 14 conductor 18 gauge multi-cable wires from controller to ERU. Follow the local electrical code. Cable assembly p/n ABA21602J5 provided with this unit can be used by cutting the P127 connector off and directly wiring to the appropriate controller connections.

3. Follow hookup instructions per Table 3. The batteries should be installed in the bottom of the ERU enclosure after all other wiring is completed. Connect the batteries per the wiring label on the inside of the enclosure.
4. Update software using the on-board service display and controls. Refer to software section of this document to enable ERU operation.

TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Table 3: Hookup Instructions for A\_A21241L Diagram – 211

Wire Number (18-Gauge)	ERU Connector (PCB header J1 with plug P1)	Hookup Instructions to Hydro Controller (Reference A_A21241L Electrical Schematic Diagram)	Figure #
	J1-118 (VAC2)	Remove jumper wire between C-116 and C-118, if present. Connect wire 118 to C-118. Connect wire 106 to C-106.  <b>WARNING:</b> VAC1 and VAC2 connections <u>are not</u> interchangeable!	7
	J1-106 (VAC1)		
	J1-97 (VACC)	Connect Wire 97 to C-97	7
	J1-126 (DRC)	Connect wire 126 to C-126	8
	J1-119 (DR2)	Remove jumper wire between C-119 and C-125, if present. Connect wire 119 to C-119. Connect wire 125 to C-125.  <b>WARNING:</b> DR1 and DR2 connections <u>are not</u> interchangeable!	8
	J1-125 (DR1)		
	J1-25 (30VC)	Connect 25 to C-25	9
	J1-117 (30V2)	Remove jumper wire between C-114 and C-117, if present. Connect wire 119 to C-119. Connect wire 117 to C-117.  <b>WARNING:</b> 30V1 and 30V2 connections <u>are not</u> interchangeable!	9
	J1-114 (30V1)		
	J1-113 (ER3)	Remove jumper wire between C-26 and C-113, if present. Connect wire 113 to C-113	10
	J1-26 (ER1)	Connect wire 26 to C-26	10
	J1-115 (DIS2)	Connect wire 115 to C-115. Connect wire 116 to C-116.  <b>NOTE:</b> Verify that wire connections have been made per the wiring diagram from C-115 and C-116 to the auxiliary contact at the main line service disconnect switch.	11
	J1-116 (DIS1)		
	J1-Unmarked	Not used.	N/A
3 (Green/Yellow 14 gauge)	Chassis ground	Connect wire 3 from ground stud in ERU enclosure to C-3.	12

## Wire Diagram Figures for A\_A21241L Diagram – 211

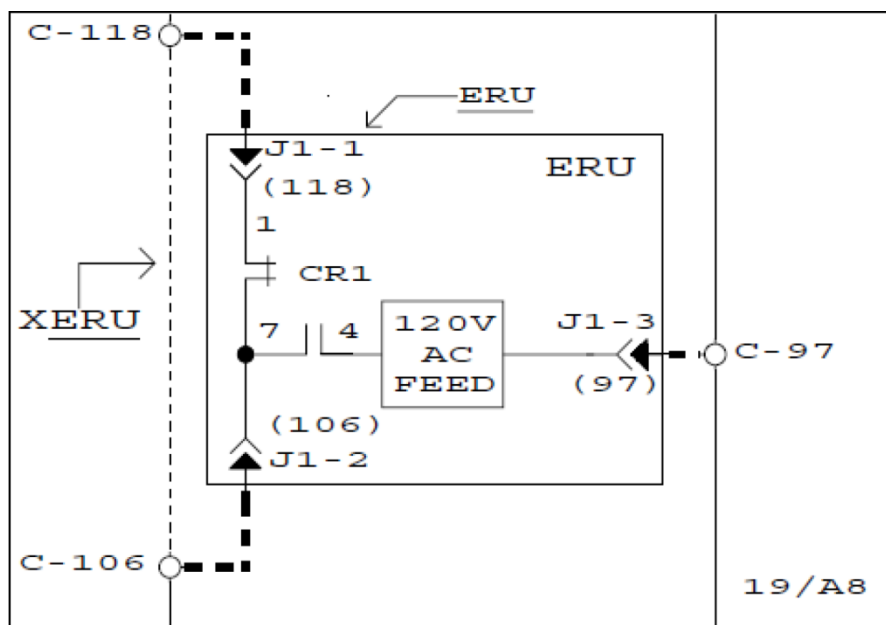


Figure 7: 120 VAC Feed

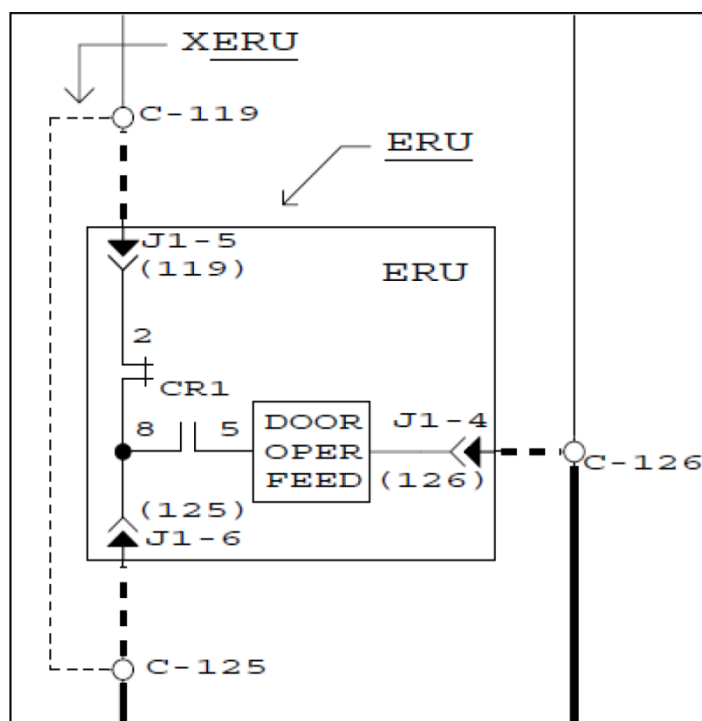
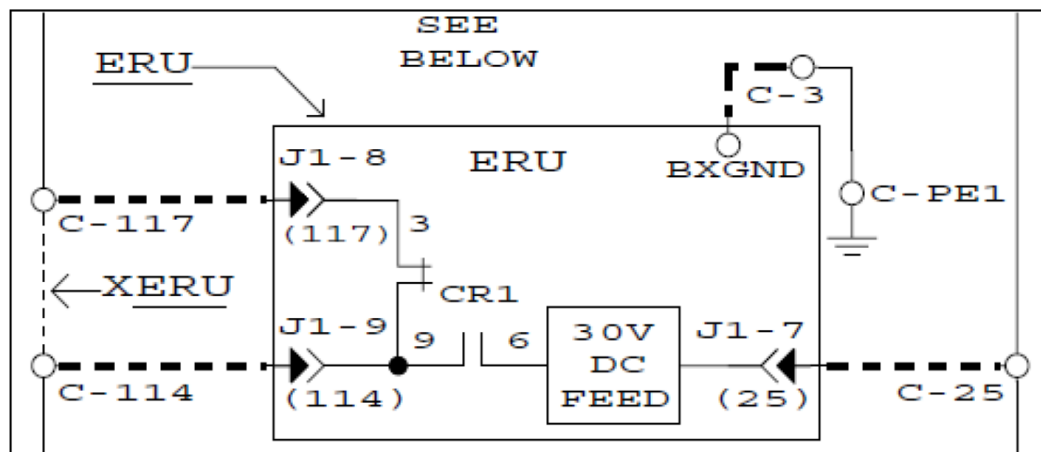
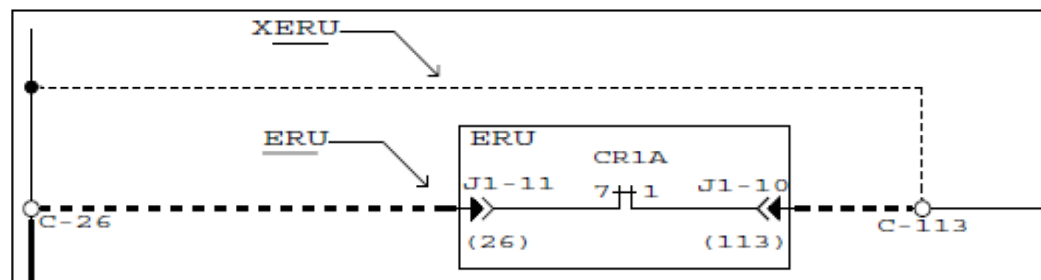


Figure 8: Door Operator Feed



### Figure 9: 30 VDC Feed



**Figure 10: Controller IOBD Input P5-1**



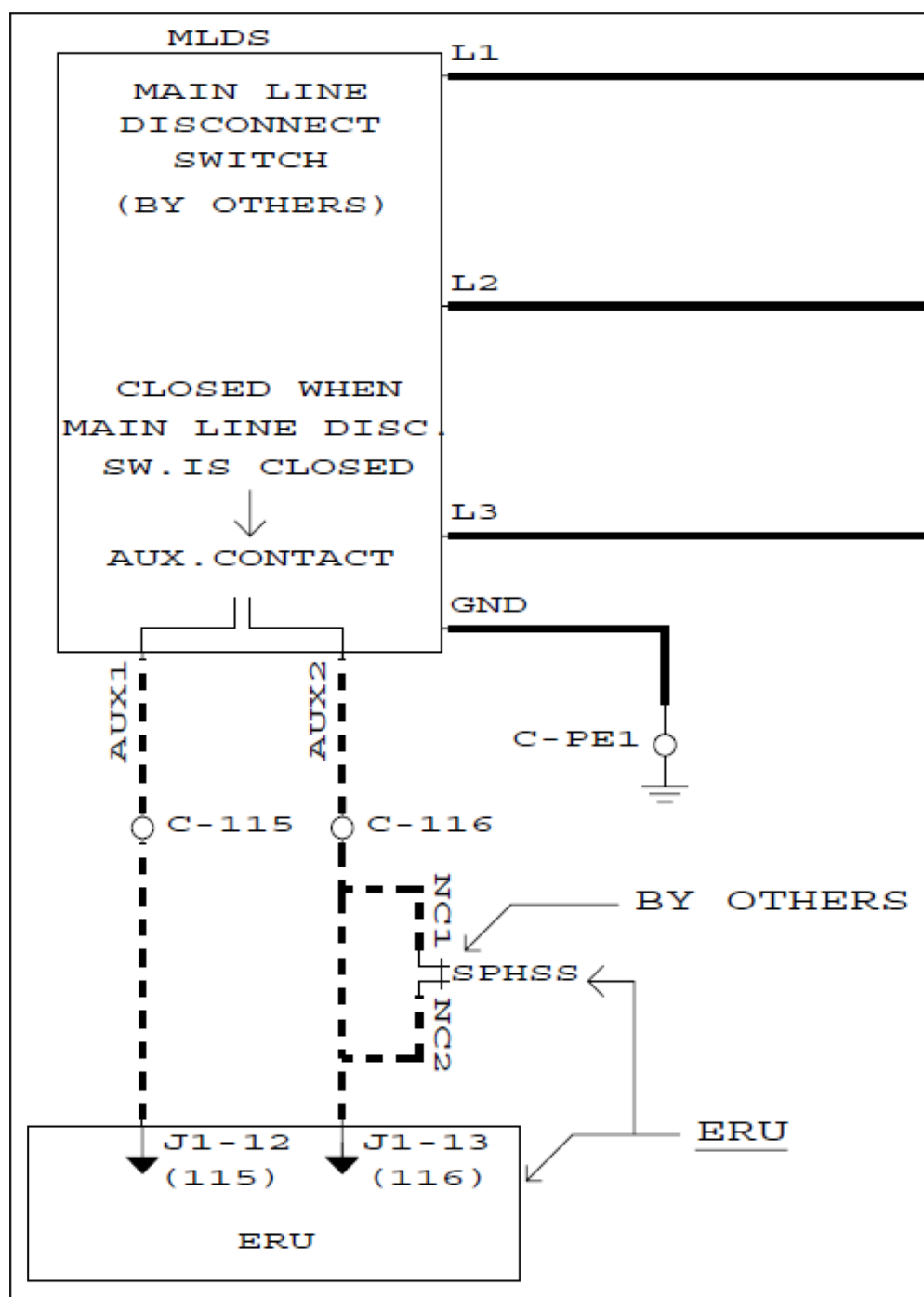
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 11: AUX Contactor Connections

TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

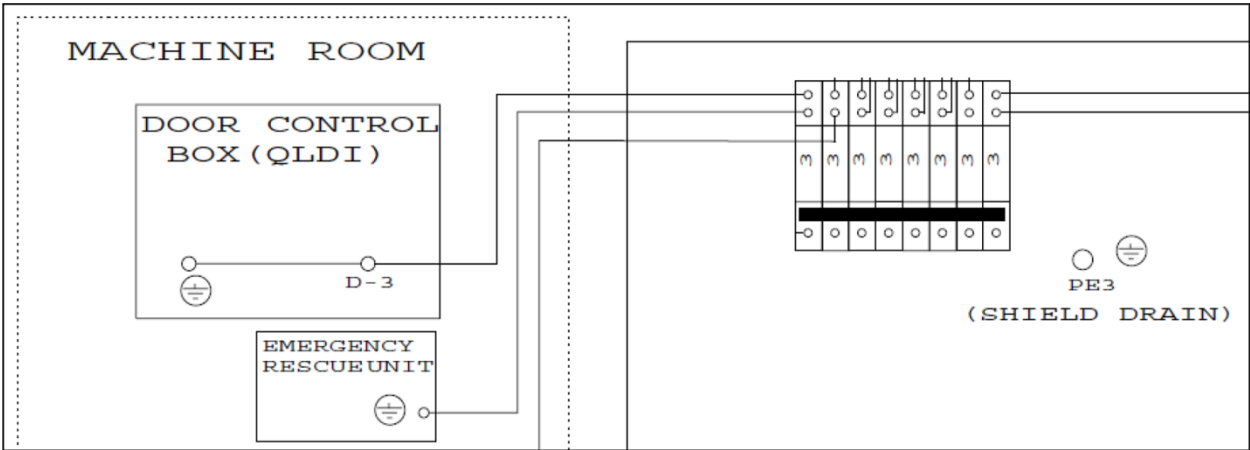


Figure 12: Chassis Ground, Controller to ERU Stud

## ERU Software Enable Using Service Display Navigator

The on-board service display and controls will allow the changes to be made to enable the ERU into operation. Figure 13 shows the on-board service display controls. The left button (S2) activates the displays of the main functions and the right button (S3) activates the sub-functions to each of the main functions. Maintaining pressure on a button for one second advances the display to the next function/sub-function.

Follow the flow chart to enter the “OCSS” main function menu. Once in the correct main menu, advance to sub-functions menu symbol code “**EPO-P.**” This will be the landing designated as the return landing when ERU goes on line, the default is 255 before changing value. To edit the data, press both (S2) and (S3) until the scrolling stops and the data displays. To increase the value, press the (S2) button. To decrease the value, press the right (S3) button. To save the changes/exit the edit mode, press both buttons (S2) and (S3) simultaneously. Automatic exiting of the edit mode occurs after 25 seconds of inactivity. The last values displayed are stored on exit.

Follow the flow chart to enter the “MCSS” main function menu. Once in the correct main menu, advance to sub-functions menu symbol code “**ERU Enable.**” Follow the same edit instructions as the OCSS above.

**NOTE: Elevator must be in inspection mode to accept changes.**

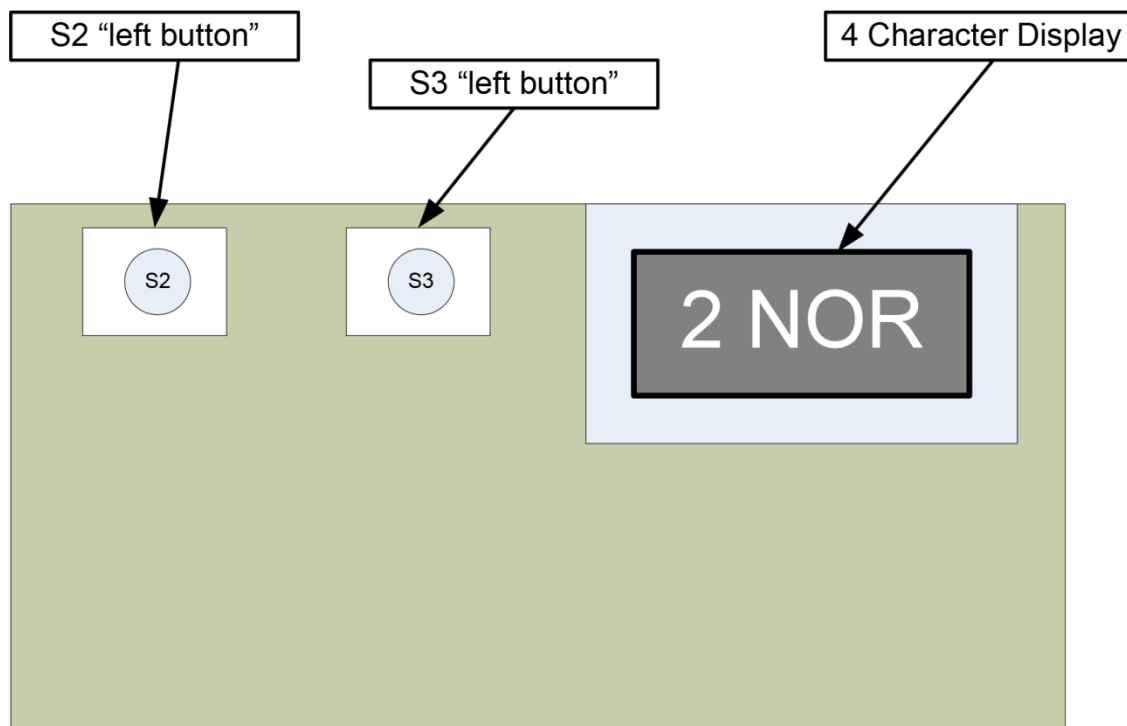
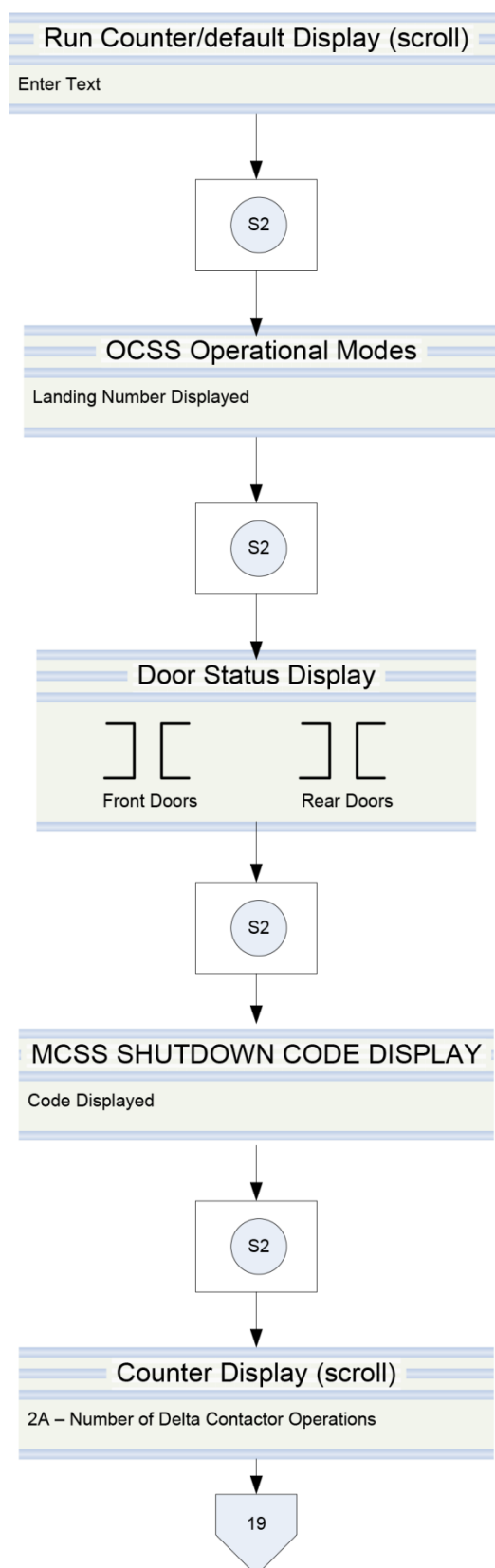
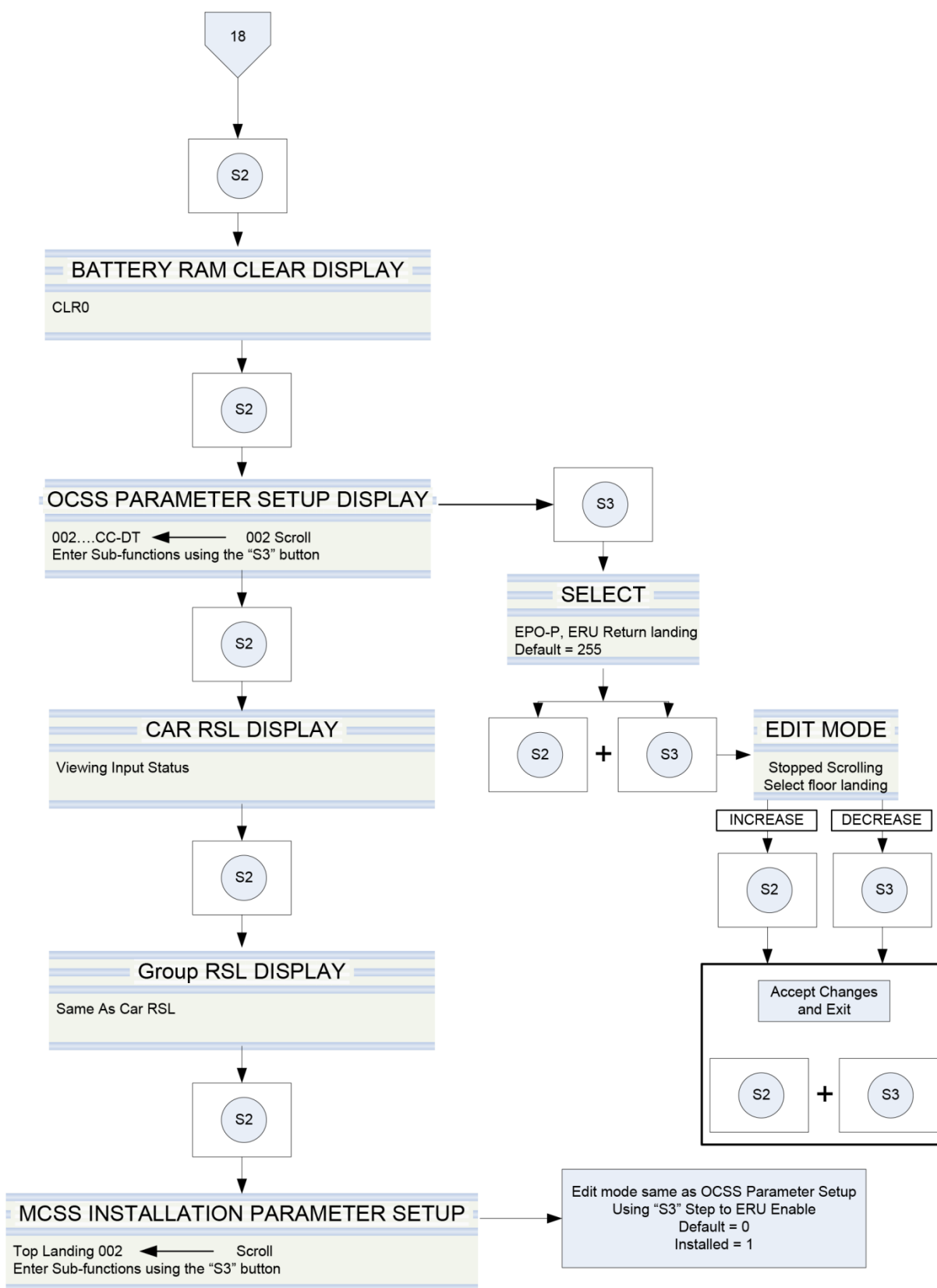


Figure 13: On-Board Service Display Controls

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TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

## AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU) Installation Instructions

### 7900AT Wire Diagram

1. An auxiliary contact (not supplied by UNITEC) must be installed at the main line service disconnect switch before installing the ERU. The contact should be closed when the disconnect switch is ON. Also make certain that a reverse phase relay (RPR) is installed in the controller.

**CAUTION:** Lock out and tag out the main line disconnect before making any connections to the controller or the main line.

2. Mount the ERU as desired,

**NOTE:** Verify the batteries are not connected at this time. Conduit should be used to run the 14 conductor 18 gauge wires from controller to ERU. Follow all local electrical codes. Route the 14 wires listed in the left-hand column through conduit from the ERU to the hydro controller. Connect the first 13 wires to the ERU connector plug (P1) as listed in the middle column. The “118” end of the ERU connector plug should line up with pin 1 at the bottom end of the printed circuit board header (J1.)

3. Follow hookup instructions per Table 4. The batteries should be installed in the bottom of the ERU enclosure after all other wiring is completed. Connect batteries per the wiring label on the inside of the enclosure.

TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Table 4: Hookup instructions for 7900AT Wire Diagram

Wire Number (18 gauge)	ERU Connector (PCB header J1 with plug P1)	Hookup Instructions to Hydro Controller (Reference 7900AT Wire Diagram)
	P1-118 (VAC2)	Disconnect the wire from RPR2 and splice it to the wire from P1-106. Connect the wire from P1-118 to RPR 2.  <b>WARNING:</b> VAC1 and VAC2 connections <u>are not</u> interchangeable!
	P1-106 (VAC1)	
	P1-97 (VACC)	Connect the wire from P1-97 to TRFM 10.
	P1-126 (DRC)	Connect the wire from P1-126 to TRFM 17 or 18.
	P1-119 (DR2)	Disconnect the wire from TRFM 16 and splice it to the wire from P1-125. Connect the wire from P1-119 to TRFM 16.  <b>WARNING:</b> DR1 and DR2 connections <u>are not</u> interchangeable!
	P1-125 (DR1)	
	P1-25 (30VC)	Connect the wire from P1-25 to TRFM 15.
	P1-117 (30V2)	Disconnect the wire from TRFM 14 and splice it to the wire from P1-114. Connect the wire from P1-117 to TRFM 14.  <b>WARNING:</b> 30V1 and 30V2 connections <u>are not</u> interchangeable!
	P1-114 (30V1)	
	P1-113 (ER3)	Remove J1 jumper from hydro controller. Connect the wire from P1-113 to 17CI-2.
	P1-26 (ER1)	Connect the wire from P1-26 to 17CI-1.
	P1-115 (DIS2)	Connect a wire from one side of the auxiliary contact at the main line service disconnect switch to P1-115.
	P1-116 (DIS1)	Connect a wire from one side of the auxiliary contact at the main line service disconnect switch to P1-116.
	P1-Uumarked	Not Used
Green-yellow 14 gauge	Chassis ground	Connect wire from ground stud in ERU enclosure to ground block inside controller enclosure.

## **AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU) Installation Instructions 7900AS Wire Diagram**

1. An auxiliary contact (not supplied by UNITEC) must be installed at the main line service disconnect switch before installing the ERU. The contact should be closed when the disconnect switch is ON. Also make certain that a reverse phase relay (RPR) is installed in the controller.

**CAUTION: Lock out and tag out the main line disconnect before making any connections to the controller or the main line.**

2. Mount the ERU.

**NOTE:** Verify the batteries are not connected at this time. Conduit should be used to run the 14 conductor 18 gauge wires from controller to ERU. Follow the local electrical code. Route the 14 wires listed in the left-hand column through conduit from the ERU to the hydro controller. Connect the first 13 wires to the ERU connector plug (P1) as listed in the middle column. The "118" end of the ERU connector plug should line up with pin 1 at the bottom end of the printed circuit board header (J1).

3. Follow hookup instructions per Table 4. The batteries should be installed in the bottom of the ERU enclosure after all other wiring is completed. Connect batteries per the wiring label on the inside of the enclosure.



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Table 4: Hookup Instructions for 7900AS Wire Diagram

Wire Number (18 Gauge)	ERU Connector (PCB Header J1 with plug P1)	Hookup Instructions to Hydro Controller (Reference 7900AT Wire Diagram)
	P1-118 (VAC2)	Disconnect the wire from RPR2 and splice it to the wire from P1-106. Connect the wire from P1-118 to RPR 2. <b>WARNING:</b> VAC1 and VAC2 connections <u>are not</u> interchangeable!
	P1-106 (VAC1)	
	P1-97 (VACC)	Connect the wire from P1-97 to TRFM 10.
	P1-126 (DRC)	Connect the wire from P1-126 to TRFM 17 or 18.
	P1-119 (DR2)	Disconnect the wire from TRFM 16 and splice it to the wire from P1-125. Connect the wire from P1-119 to TRFM 16. <b>WARNING:</b> DR1 and DR2 connections <u>are not</u> interchangeable!
	P1-125 (DR1)	
	P1-25 (30VC)	Connect the wire from P1-25 to TRFM 15.
	P1-117 (30V2)	Disconnect the wire from TRFM 14 and splice it to the wire from P1-114. Connect the wire from P1-117 to TRFM 14. <b>WARNING:</b> 30V1 and 30V2 connections <u>are not</u> interchangeable!
	P1-114 (30V1)	
	P1-113 (ER3)	Remove jumper between Studs 1 and 16. Connect the wire from P1-113 to Stud 16 on the hydro controller.
	P1-26 (ER1)	Connect the wire from P1-26 to Stud 1 on the hydro controller.
	P1-115 (DIS2)	Connect a wire from one side of the auxiliary contact at the main line service disconnect switch to P1-115.
	P1-116 (DIS1)	Connect a wire from one side of the auxiliary contact at the main line service disconnect switch to P1-116.
	P1-Uumarked	Not Used
Green-yellow 14-Gauge	Chassis ground	Connect wire from ground stud in ERU enclosure to ground block inside controller enclosure.

## AUT-O-Safe<sup>®</sup> Emergency Return Unit (ERU) Initial Power on Test

1. The front panel test switch should be in the **normal** position.
2. Switch the main line service disconnect switch to its closed ON position.
3. Verify that the front panel meter and charging indicator light is **green** on the ERU, indicating the batteries are charging. Fully charged batteries read 27.3 volts. Voltage less than 27.3 indicates that they are in some degree of discharge. The lower the voltage, the more discharged the batteries. The battery charger has a peak current limit of 0.833 amps.
4. If less than a month has elapsed from ERU shipping to battery installation, the meter should read greater than 25.5 volts and should reach full charge within 2 to 4 hours. The ERU will not perform backup operation if the battery charging voltage is less than ~25.5 volts. Please allow sufficient charging prior to attempting backup operation.
5. Verify that the elevator operation is normal. In this state, the ERU simply passes its three incoming power supply voltages through normally closed relay contacts downstream to the controller.
6. To test backup operations, change the test switch to its TEST position to break incoming 115 VAC power the ERU. The test buzzer immediately activates and will remain activated as long as the switch is in the TEST position. Approximately six seconds after changing the switch to TEST, the amber indicator should light indicating that backup power is being provided. The green charging indicator should now be off. The ERU should be providing 115VAC at VAC1-VACC, 110VDC at DR1-DRC, and 28VDC at 30VI-30VC. The contact status state between ER1 and ER3 should be open at this time indicating to the controller that backup power is in effect.
7. Elevator operation should revert to emergency return mode: hall and car calls become inhibited, doors close, warning buzzer sounds, exit jewel lights, car moves to lowest landing, doors open allowing passenger exit, then the doors close and the car parks.
8. The ERU supplies backup power for ~4-minutes. At the completion of this time period, the ERU shuts itself down to a zero battery drain state (front panel meter shows zero) and awaits return of normal power, which, for this test case, means returning the test switch to the NORMAL position.

**NOTE:** At any time during the 4-minute period, if normal power is restored, the ERU returns to its standby state wherein it simply charges the batteries and passes through the incoming power.

9. Return the test switch to NORMAL. The buzzer should immediately go off. The panel voltmeter and green indicator light should show a charging battery state and the amber

indicator light should be off. If the batteries were fully charged at the beginning of the test, two to four hours of charging will be required to reach a fully charged state. However, the ERU should be able to perform a full backup operation once the charging voltage reaches ~25.5 volts.

## Emergency Return Unit (ERU) Operation Setup Test

1. Place the car at an upper landing.
2. Jump the auxiliary microswitch contact in the mainline disconnect.
3. **Remove power by turning off the mainline disconnect. Lock out, tag out, test and verify.**

After about 5 seconds, the ERU activates, and brings the car down to the landing indicated by OCSS parameter EPO-P (If EPO-P = 255. The car returns to the bottom landing. The car first opens, then closes the doors, and then switches to an idle state. The door open button remains operable.

- If the car is above the EPO-P landing when the ERU activates, the car returns to that landing. Otherwise, it returns to the bottom floor.
  - If a “J” switch is furnished, the car may level down to the next door zone and cycle the doors before returning to the ERU return landing.
  - If the ERU operation fails, make sure the MCSS parameter, ERU ENABLE, is set to a 1. Verify ERU is enabled using service display navigator.
  - If the ERU operation still fails, confirm ERU battery voltage is above 24.6 volts. If battery voltage is low, ERU will not turn on when power is removed from the elevator.
  - Once the car is idle, the on-board display shows STP (stall protection) prefixed with the number of the landing where the car is shut down.
4. Press the S2 button twice to display code ERU.
  5. Remove the jumper from the auxiliary contact in the mainline disconnect. Restoring the mainline power resets the ERU and returns the car to service.

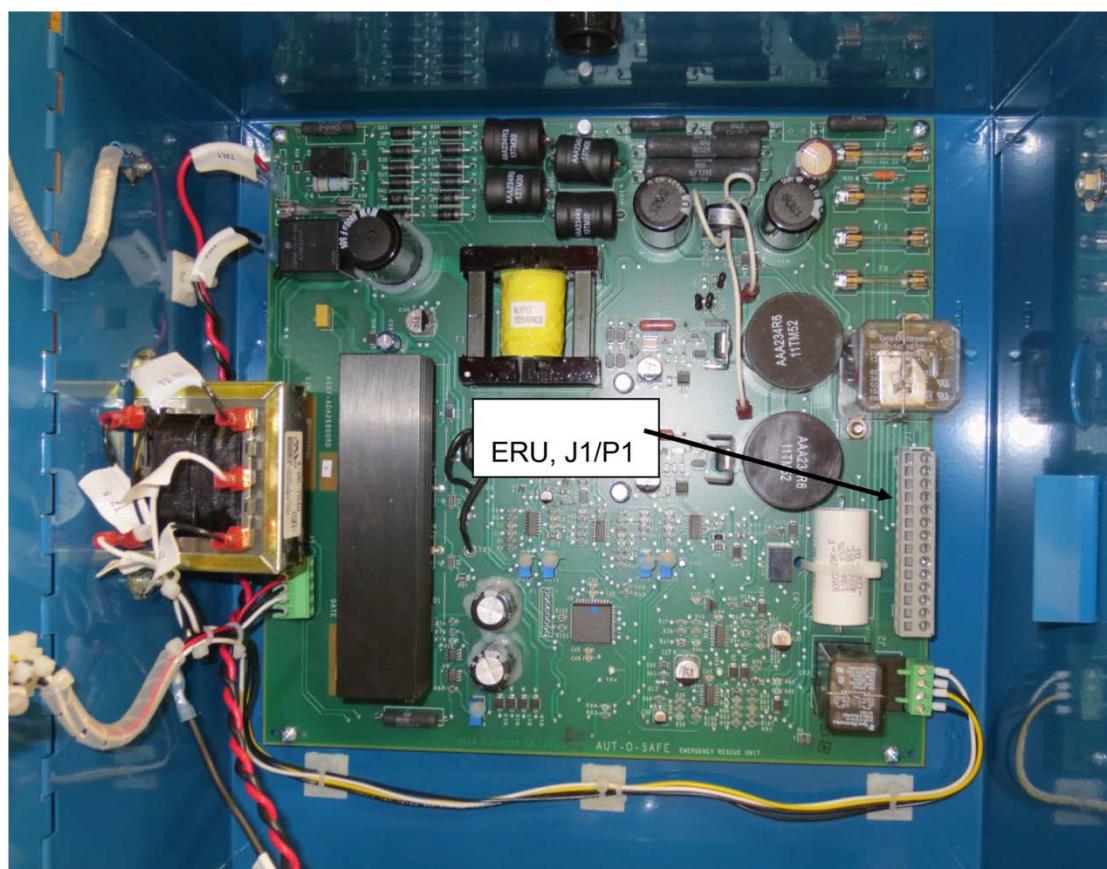
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 14: ERU

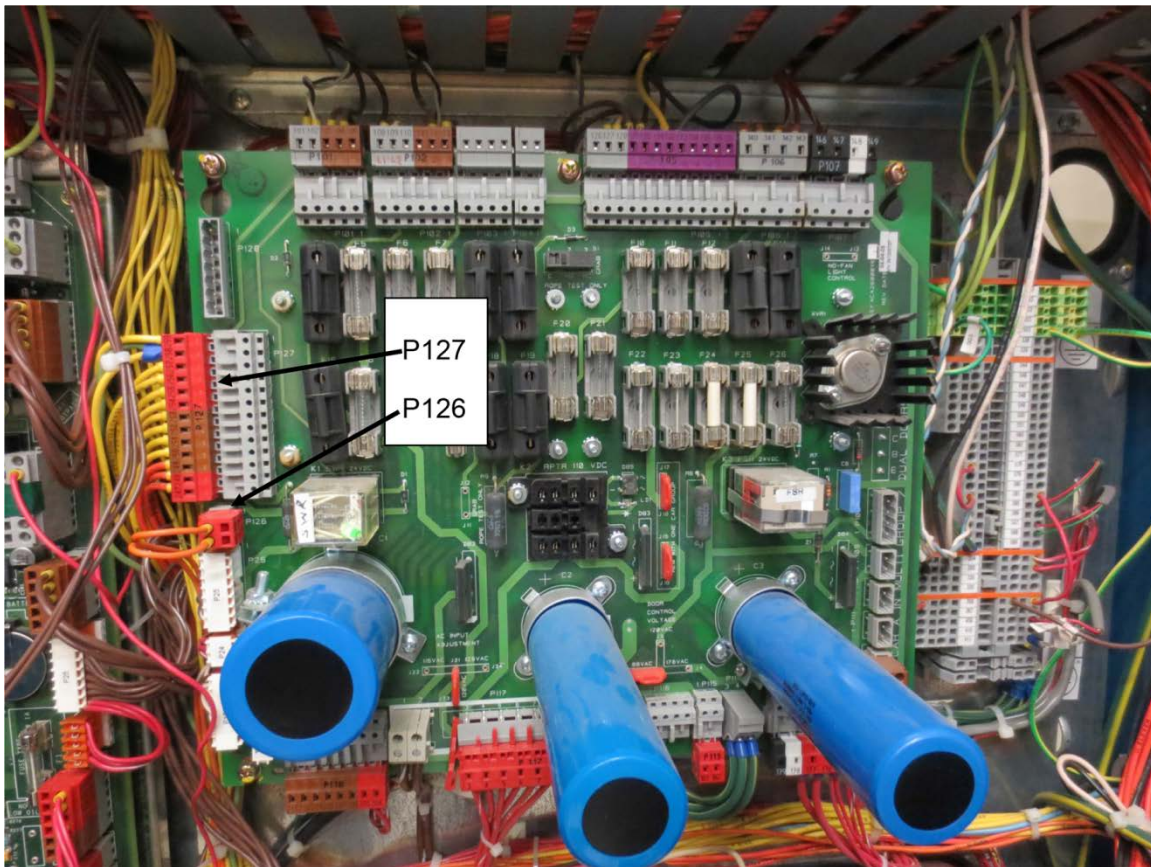
TECHNICAL INFORMATION FOR AUT<sup>®</sup>-O-SAFE EMERGENCY RESCUE UNIT

Figure 15: 211 Controller