

INDELAC

CONTROLS, INC.

Electric Fail-Safe Device Battery Backup System Installation, Operation & Maintenance Manual

*For Use with:
24vdc Units
10 & 30 Amp Units*

REVISED: OCT 2021

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or to request additional support

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INTRODUCTION:

Thank you for selecting Indelac Controls, Inc. (ICI) for your UPS / Battery Backup System needs. We at ICI are proud of our products and feel confident they will meet or exceed your expectations of quality and reliability.

Every precaution has been taken to insure that your equipment will arrive undamaged; however, accidents do occur. Therefore, the first thing you must do upon receipt of your package is to inspect it for damage. If the box is damaged there is a possibility that the equipment inside the box may be damaged as well. If this is the case **YOU MUST FILE A CLAIM** with the delivering **CARRIER**. All shipments are **F.O.B.** our factory and it is **YOUR RESPONSIBILITY** to file a claim for damages.

NOTE: ICI'S ELECTRIC FAIL-SAFE DEVICE MAY BE USED WITH OTHER BRANDS OF ELECTRIC ACTUATORS - ACTUATOR TERMINAL CONNECTIONS WILL NOT BE THE SAME. CONTACT SALES TO VERIFY APPLICATION FIT.

STORAGE:

If the Fail-Safe Device is scheduled for installation at a later date:

1. Store off the floor protect with unsealed cover allowing for side and bottom ventilation. In the event that the unit is going to be stored where there is insufficient temperature control internal heaters must be installed and energized to protect the unit from condensation and extreme temperature variations.
2. Store in a climate controlled building.
3. Store in a clean and dry area.
4. See the Maintenance Section in this Manual for Proper Care of the Battery.

FOR FUTURE REFERENCE RECORD:

1. Fail-Safe model number _____
2. Fail-Safe enclosure type NEMA 4 _____, NEMA 4X _____, NEMA 7 _____.
3. Fail-Safe output Voltage _____
4. Fail-Safe serial number _____
5. Date of installation _____ Put into operation _____

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PRODUCT DESCRIPTION:

The Indelac Controls DC Electric Fail-Safe Device provides battery backup power to your actuator in the unlikely event that the Factory or Facility Mains Power should go down. These devices are designed to seamlessly supply 24vdc battery standby power to power your 24vdc actuator. The battery supplies an internal Backup Module that supplies backup DC to run the actuator to the user wired Fail Position when the Mains Power fails. When normal Mains Power is present, it powers the actuator and provides a maintenance charge to the backup batteries. When the Mains Power fails or drops out momentarily, the Backup Module will automatically switch over to battery power and supply a constant 24vdc to the actuator. When the Mains Power comes back online, the Backup Module will immediately transfer Mains Power back to the actuator and proceed to re-charge and maintain the batteries.

Indelac provides these DC Fail Safe Devices in NEMA 4, NEMA 4X or NEMA 7 enclosures to provide 10 or 30 Amps of output power. Each Fail-Safe Device is designed to supply the actuator's continuous Full Load Ampere draw to drive the Actuator to the Fail-Safe position. When selecting the Fail-Safe Device to back up your actuator power, 10 Amps or 30 Amps is the MAXIMUM current output to the load. Therefore, the Locked Rotor Amps or Start-Up Current of the Actuator needs to be figured into the maximum 10 Amps or 30 Amps output.

The Fail-Safe Device will float charge the on-board Sealed Lead Acid Batteries when Mains Power is ON. Depending on the size & age of the batteries used in the Fail-Safe Device, battery charge time can vary from hours to overnight for a full charge.

Optional features, such as Emergency Disconnect Switches, Internal Heaters and Internal Relays to run more than 1 actuator to Fail Position may be ordered – Consult the Factory for available **SPECIAL Options**.



24vdc 10 Amp NEMA 4X Version Shown

UNIT SPECIFICATIONS:

Enclosure rating:	NEMA 4; NEMA 4X & NEMA 7
Operating Voltages:	24vdc
10A Fail-Safe Output Fuse:	10 Amp, 250VAC, Slow Blow, 5x20mm
30A Fail-Safe Output Fuse:	40 Amp, 32VDC, Slow Blow, MEGA Cartridge
Light Indicators:	Green = Power; Yellow = Battery; Red = Mains ON

The following chart shows the Standard Fail-Safe Device Part Numbers and the related Specifications for each unit. *There are 2 – 12vdc batteries in each Fail-Safe Device.*

Part Number	Output Voltage	Current Output	Output (Watts)	Battery AHr	NEMA Rating	Enclosure Dimensions	Weight – lbs.
322-10E-CS4	24	10A	240	2 - 5	4	12”L x 12”W x 6”D	24
322-10E-SS4X	24	10A	240	2 - 5	4X	12”L x 12”W x 6”D	26
322-10E-AL7	24	10A	240	2 - 5	7	12”L x 12”W x 6”D	86
322-30E-CS4	24	30A	720	2 - 14	4	16”L x 16”W x 6”D	63
322-30E-SS4X	24	30A	720	2 - 14	4X	16”L x 16”W x 6”D	64
322-30E-AL7	24	30A	720	2 - 14	7	18”L x 18”W x 6”D	335

** NEMA 4X Enclosures are Stainless Steel.

WIRE SIZING AND LENGTHS:

Indelac recommends the Installer follow the wire gauge chart shown below when connecting the Fail-Safe Device to the actuator. The Fail-Safe Device should be mounted at the shortest distance possible to the actuator to assure best possible performance. Indelac DOES NOT recommend that the Fail-Safe Device be mounted any further than 50 feet from the actuator.

WIRE GAUGE

24vdc Fail-Safe Device	16	14	12	10	8
Amperage	MAXIMUM Distance in Feet From Fail-Safe				
10 Amp	10	20	30	50	70
30 Amp	-	-	10	15	25

WARNING!

WIRING MUST CONFORM TO ALL STATE AND LOCAL ELECTRICAL WIRING CODES.
 THIS DEVICE SHOULD BE INSTALLED BY A LICENSED ELECTRICIAN.
 IMPROPER POWER CONNECTION CAN RESULT IN DAMAGE TO THE COMPONENTS OR SERIOUS INJURY TO THE INSTALLER.
 VERIFY THAT ALL WIRES ARE DE-ENERGIZED BEFORE MAKING ELECTRICAL CONNECTIONS!

ELECTRICAL CONNECTIONS & WIRING DIAGRAMS:

All wiring is to be completed through the conduit openings using the appropriate conduit – Refer to your local electrical codes. Open the Fail-Safe Device door by turning the latch counter-clockwise using a flat head screwdriver. To Open the Door on the NEMA 7 enclosure, ALL of the outer Door bolts need to be removed before Opening at the hinge. Connect the Main Power to the Fail-Safe Device & connect the Fail-Safe Device to the actuator per the appropriate wiring diagram below. Assure that the power wires are DE-ENERGIZED!

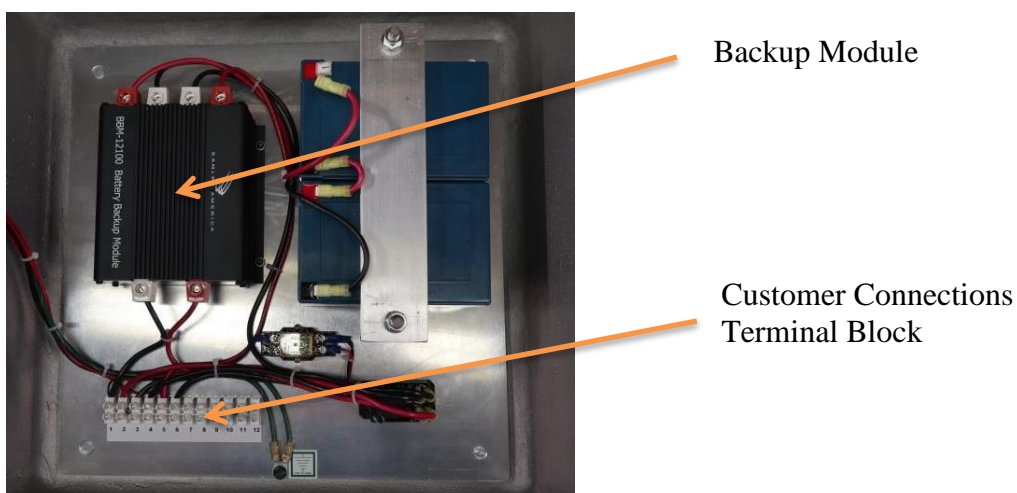
Mount the Fail-Safe Device to a solid surface using the appropriate hardware. These units are heavy and using hardware that is not appropriate or too small may cause the Fail-Safe Device to separate from its mounting and become damaged. See the Unit Specifications Section for dimensions and weights.

CAUTION: Make sure that the wires are DE-ENERGIZED BEFORE making any electrical connections. Serious damage to the components or serious injury/death may occur.

Also verify that the proper voltage and wiring is being connected to the Fail-Safe Device and matches the required input of BOTH the Device and the Actuator.

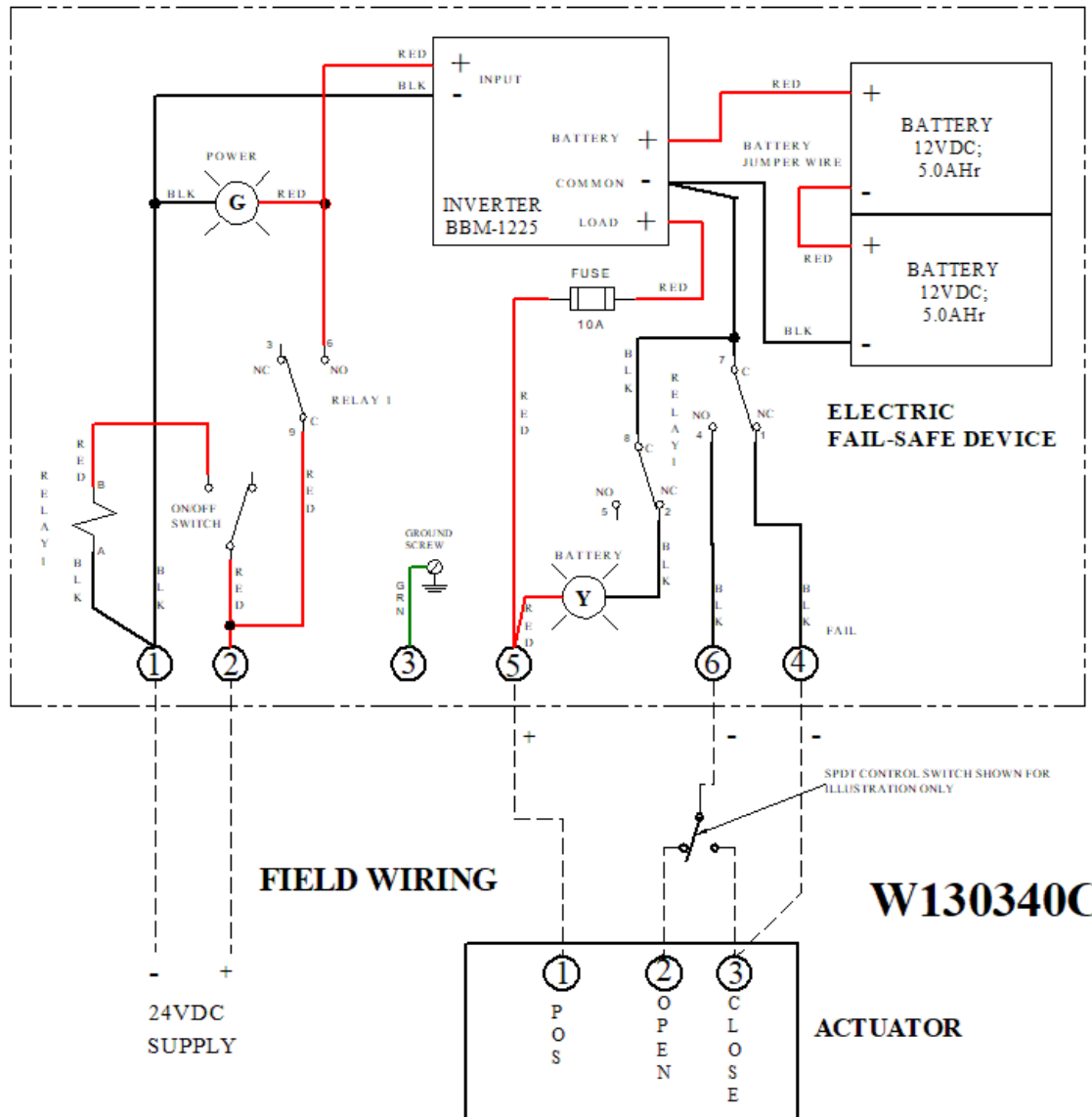
NOTE: Two (2) conduit openings are supplied in the cabinet housing of the Fail-Safe Device. One opening is for the incoming DC power wires and the other is for the Outgoing Power wires to the actuator. All wires are to be securely tightened into the Customer Connections Terminal Block.

NOTE: For all wiring, make sure the connectors and wires are fully seated after making all wiring Connections and Screw Terminals are tight!



30 Amp NEMA 7 Version Shown, Internal Connections View

10 AMP 24VDC FAIL-SAFE DEVICE WIRING/CONNECTION DIAGRAM



Wiring diagram shows the Actuator wired for FAIL CLOSE – the Fail Terminal #4 is wired to the CLOSE Terminal on the Actuator. When the incoming Mains Power Fails or is shut OFF, Terminal #4 will be energized Negative (-) to drive the Actuator to the CLOSE Position. This Terminal #4 may also be connected to the OPEN Terminal on the Actuator to drive the Actuator OPEN when power fails.

W171228

ELECTRIC FAIL-SAFE DEVICE

FIELD WIRING

ACTUATOR

24VDC SUPPLY

RELAY 1 = 30A
RELAY 2 = 10A

ON/OFF SWITCH

GROUND SCREW

FUSE 40A

BATTERY 12VDC; 14AHr

BATTERY JUMPER WIRE

SPDT CONTROL SWITCH SHOWN FOR ILLUSTRATION ONLY

POS
OPEN
CLOSE

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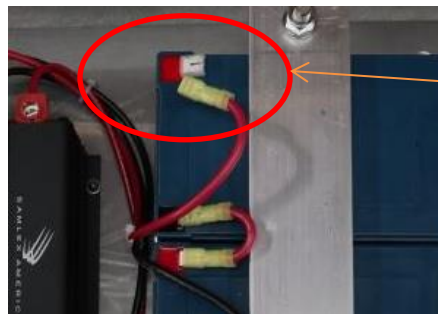
FAIL-SAFE SET-UP & OPERATION:

SET-UP:

When the Fail-Safe Device is mounted and all wiring has been completed to the proper wiring diagram, the final Set-Up steps can be completed. The Fail-Safe unit is internally wired and ready to be enabled.

- 1) If the front panel door to the Fail-Safe Device is not open, open it using a flat head screwdriver to unlock the door latch. On the NEMA 7 Device, you will need to remove ALL of the outer door bolts to open the door!
- 2) Check all wiring connections again and verify that all wiring, relays and terminals are tight.
- 3) Plug the battery RED lead into the RED Battery Terminal. This has been removed to ship the Fail-Safe Device.
- 4) At this time, the Fail-Safe Device has power to the output terminals and the unit is **LIVE!**
CAUTION: Depending on the position of the Actuator when the set-up was completed, it may start to move.

CAUTION: WHEN ENABLING THE FAIL-SAFE DEVICE AND APPLYING MAINS POWER TO THE UNIT, LIVE VOLTAGE IS PRESENT! TAKE GREAT CARE NOT TO TOUCH THE POWER TERMINAS - SERIOUS INJURY OR DEATH MAY OCCUR!



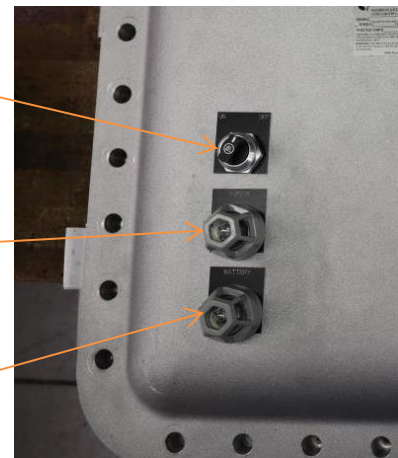
Install RED Lead
onto RED Battery
terminal

Battery Connection

- 5) Apply Incoming Mains Power to the Fail-Safe Device and turn ON the front panel Power Switch.
CAUTION: This will apply Mains Power to the Actuator and depending on the position of the Actuator, it may move again.
- 6) When the Front Door Power Switch is turned ON, the Front Door Power Switch should illuminate Red, the Green POWER Light should turn ON to indicate that the Fail-Safe Device is Enabled.
- 7) Close and Latch (or Bolt) the Front Door securely Closed.

OPERATION:

When the Fail-Safe Device is in the Normal Mode, the Red Front Door Power Switch will be illuminated Red and the Green POWER Light will be ON for the NEMA 4 & NEMA 4X. On the NEMA 7 Version, there will NOT be a Red Light on the ON/OFF Switch. If the Green POWER Light turns OFF, there is a blown output fuse and the actuator will not run.

**NEMA 4 & 4X****ON/OFF
Switch****POWER
Light****BATTERY
Light****NEMA 7**

The Fail-Safe Device is designed so that when the Mains Power Fails, or the Front Door Power Switch is turned OFF, the Red Power Switch Light and Green POWER Light will turn OFF and the Yellow BATTERY Light will turn ON. This indicates to the User that the Fail-Safe Device is running on Battery Power and should deliver Power to the User selected Fail Terminal on the Actuator and the Actuator will drive to that position. This power transfer takes only milliseconds and happens automatically without any User interface.

When the Mains Power returns, the Fail-Safe Device will automatically switch the Battery power OFF and enable Mains Power back to the Actuator. When this happens, the Yellow BATTERY Light will turn OFF and the Green POWER Light and Red Switch Light will both turn back ON. At this time, the battery will go into a FLOAT charge mode.

If the Green POWER Light does NOT turn ON, but the Mains Power has been checked and is good to the Fail-Safe Device, it is possible that the internal Output Fuse has blown. See the Maintenance Section for how to check this fuse.

If the Mains Power has shut down and the Yellow BATTERY Light does not come ON and there is NO AC Power to the Actuator, the internal Output Fuse may have blown or the Power Inverter was damaged. See the Maintenance Section for how to check these devices.

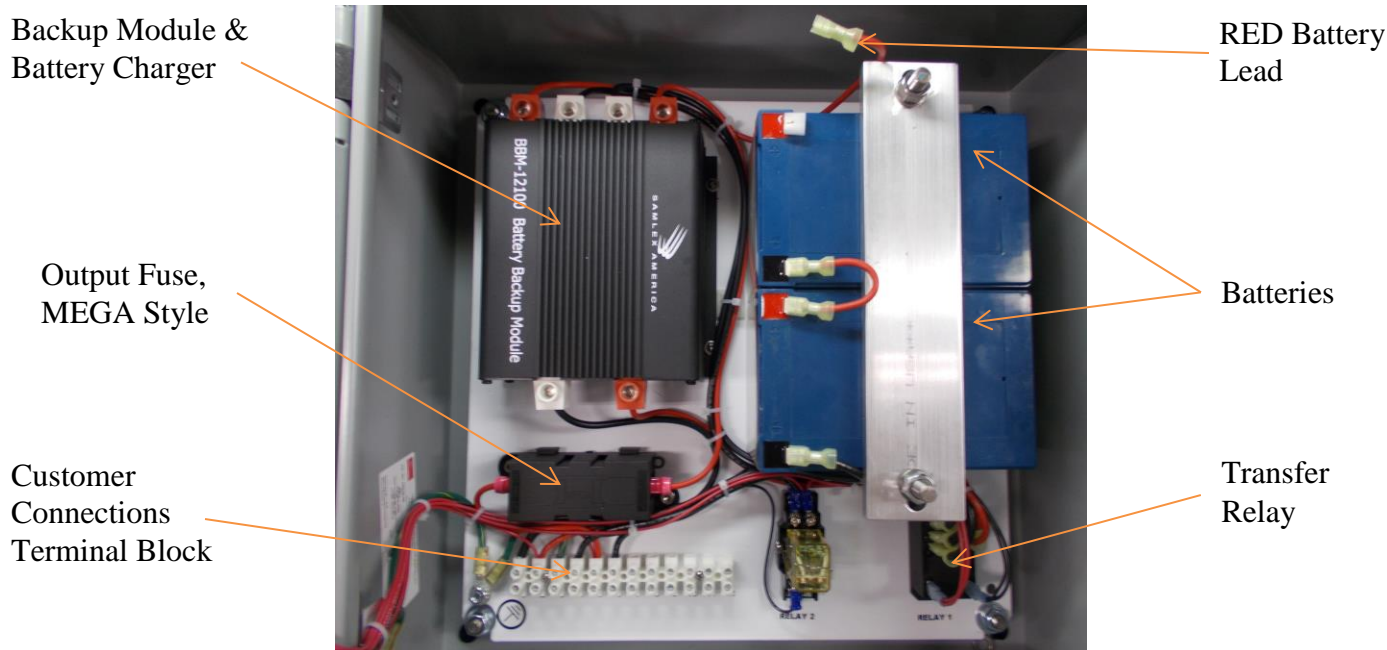
BATTERY RUN TIMES:

Each of the Fail-Safe Devices has a minimal run time depending on the load and charge of the battery. These Devices are calculated to have a continuous battery run time of **10 to 12 minutes** under full capacity load. For example, the 10 Amp Device will run under battery power for 12 minutes under a 10 Amp continuous load draw. Therefore, if the load draw is less than the Device's current rating, the battery run time will be longer. The Fail-Safe Device is designed to run the Actuator to the wired FAIL position and hold there until Mains Power comes back ON. All of the Indelac Actuators will complete an OPEN or CLOSE cycle in less than the 10 to 12 minutes under full load with a fully charged battery.

If longer battery run times are required, contact Indelac Controls for special order Fail-Safe Designs.

MAINTENANCE:

After proper installation, the Fail-Safe Device requires no actual maintenance. This unit should operate for 4-5 years on the original battery as long as the Mains Power is applied and the power is ON to maintain the internal battery charger. However, we do recommend a periodic battery check to assure that the battery is retaining a charge. This can be accomplished by using an Electrical DC Meter to measure the battery voltage. Measure between the RED Lead of the top battery and the BLACK Lead of the other battery. This voltage should measure between 22 to 25vdc. If this voltage is too low, try allowing the batteries to charge with the Mains Power ON. If after this charge (usually overnight), the batteries are still low, the batteries need to be Replaced!

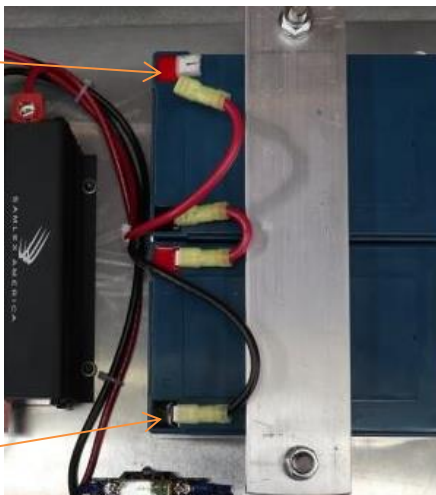


Internal View of 30A NEMA 4 Fail-Safe Device

RED Meter Lead

Measure on DC Volts
22-25vdc

BLACK Meter Lead

**Battery Measurement Test Points**

The following chart has been provided to log the periodic maintenance battery checks:

	BATTERY MAINTENANCE LOG	
Date	Checked By:	24vdc Measurement

MAINTENANCE (con't.):

The Fail-Safe Device can be **stored** for 4-6 months in the “no load” condition before the battery will need to be recharged. If these Units are stored longer than this before being installed, the customer needs to implement a program to charge these batteries for 8-10 hours every 4 months. This will maintain the batteries until installation. If these batteries are NOT maintained, they will be too low or **dead** and not operate when installed.

If the Fail-Safe Device is installed, the Mains Power needs to be turned ON to maintain the battery. The internal trickle charger will maintain the battery for use when needed. If the Mains Power is shut OFF or the Mains Power Breaker has tripped, the Fail-Safe will be operating under battery power and illuminates the Front Door Yellow Light. This will drain the battery more quickly.

ATTENTION: IF THE BATTERY IS NOT PROPERLY MAINTAINED, THE BATTERY WILL BE TOO LOW TO DRIVE THE ACTUATOR TO THE FAIL POSITION WHEN NEEDED!

To charge a **low battery**, make sure the Mains Power and Front Door Power Switch is ON. Once the batteries charge measures below 16vdc, they may not take a charge due to internal cell damage. Even if the batteries do take a charge, they may be unreliable and **SHOULD** be **REPLACED**!

OUTPUT FUSE (smaller fuse – 10A Version):

When the Green POWER Light on the Front Door of the 10A Fail-Safe Device does NOT turn ON when the Mains Power or Battery Power is active, the Output Fuse may be blown. This Fuse is a **10A Slow Blow** Cartridge 5x20mm Fuse rated for 250VAC. **Indelac Part # 46039.**

To check the Fuse on the 10A Devices, follow the below steps:

- 1) Remove ALL power from the Fail-Safe Device and remove the fuse from the holder.
- 2) Using an Electrical Meter, check the continuity of the fuse.
- 3) If it is blown, replace with the proper fuse value as listed above.
- 4) Turn the Mains Power back on and check to see if the Front Door Green Light is ON.
- 5) If the Green Light is still not ON, there may be a problem with the Backup Module or Battery and the unit will need to be returned to Indelac for Service.

OUTPUT FUSE (larger fuse – 30A Version):

When the Green POWER Light on the Front Door of the 30A Fail-Safe Device does NOT turn ON when the Mains Power or Battery Power is active, the Output Fuse may be blown. This Fuse is a **40A Slow Blow** Cartridge MEGA Fuse rated for 32VDC. **Indelac Part # 46069.**

To check the Fuse on 30A Devices, follow the below steps:

- 1) Remove ALL power from the Fail-Safe Device and remove the fuse from the holder.
- 2) Using an Electrical Meter, check the continuity of the fuse.
- 3) If it is blown, replace with the proper fuse value as listed above.
- 4) Turn the Mains Power back on and check to see if the Front Door Green Light is ON.
- 5) If the Green Light is still not ON, there may be a problem with the Backup Module or Battery and the unit will need to be returned to Indelac for Service.

SPARE PARTS:

The Indelac Fail-Safe Devices are maintenance free units. The only parts that are field replaceable are the internal 12vdc batteries and fuses. A list of the batteries and their part numbers are shown below. The fuse part numbers are listed in the Fuse Descriptions in the **Maintenance Section**. When calling for spare parts, please include your Model Number, Serial Number, Description and Date of Installation.

If the unit is not working and it is suspected that there is a failure in the Backup Module, the Fail-Safe Device will need to be sent back to Indelac for repair and calibration.

Spare Part	Indelac Part Number
Battery, 5AHr (x's 2)	32006
Battery, 14AHr (x's 2)	32015

NEMA 7 ENCLOSURE, GENERAL:

In general, operation and maintenance of a NEMA 7 Fail-Safe Device is no different than that of a NEMA 4 Unit. However, there are some precautions that must be followed.

- 1) **DO NOT** install in ambient temperatures that exceed **140 degrees F**.
- 2) **DO NOT** under any circumstances **remove the Fail-Safe cover** while in a hazardous location when the contacts are still live; this could cause ignition of hazardous atmospheres.
- 3) **DO NOT** under any circumstances use a **NEMA 7 Fail-Safe Device in a hazardous location that does not meet the specifications for which the Unit was designed**. The Fail-Safe Device is clearly tagged with the NEMA classification it was designed for.
- 4) When removing the cover, care must be taken not to scratch, scar or deform the flame path of the cover or base of the Fail-Safe Device. This will negate the NEMA 7 rating of the enclosure.
- 5) When replacing the cover on a Fail-Safe Device, take care that the gasket is in place to assure the proper clearance after the cover is secured. After securing the cover screws check the clearance between the cover and the base - a .002" thick by 1/2" wide feeler gauge may not enter between the two mating faces more than .125".
- 6) All electrical connections must be to **State and Local Codes** and in accordance with the specifications for which the unit is being used.
- 7) If the Unit has an internal heater, wait at least 45 minutes after removing power from the NEMA 7 Fail-Safe Device for cooling, before removing the cover.

**In the event maintenance is required, remove the Fail-Safe Device from the hazardous location before attempting to work on it.*

MANUAL REVISIONS

OCT 20, 2021	INITIAL RELEASE.

TROUBLESHOOTING AND FAQ'S

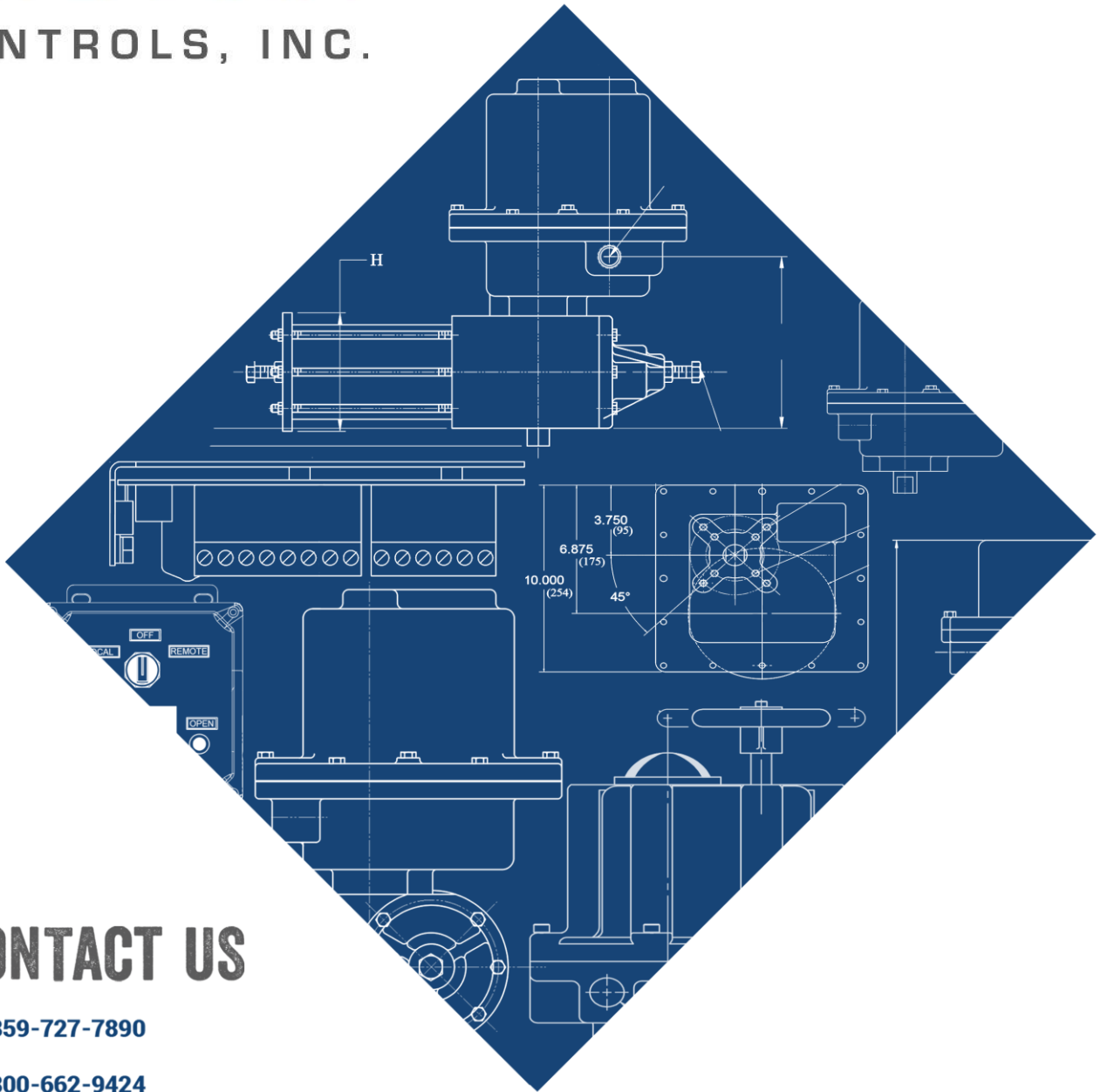
Many of the Troubleshooting Issues have been covered in the Operation and Maintenance Sections above.

SYMPTOM	PROBLEM	SOLUTION
Power Switch does NOT illuminate "RED".	Mains Power not ON or external Breaker Tripped.	Reset external Breaker and Turn ON Mains Power.
	RED ON/OFF Switch in OFF Position.	Turn ON/OFF Switch to ON.
Green POWER Light does NOT turn ON.	Mains Power has Failed & running on Battery Power.	Repair or Turn ON Mains Power.
	Internal Output Fuse is Blown.	Replace Output Fuse – see Maintenance for value.
Yellow BATTERY Light is OFF.	Unit running on Mains Power.	Normal Operation.
	Internal Output Fuse is Blown.	Replace Output Fuse – see Maintenance for value.
	Battery is Dead or Extremely Low.	In FAIL Mode, if Battery is Low or Dead, Battery may need to be Replaced.
Actuator does NOT go to FAIL position when Mains Power Fails.	Battery is Dead or Extremely Low.	Re-charge or Replace Battery.
	Wiring from Fail-Safe FAIL Terminal to Actuator is Loose or became Disconnected.	Check and reconnect wire into appropriate Terminals. Assure tight connection – see correct Wiring Diagram.
	Internal Output Fuse is Blown.	Replace Output Fuse – see Maintenance for value.
	Internal Failure of Backup Module.	Call Indelac for Service.
No Output Power to the Actuator in Normal Mode.	Blown internal Output Fuse.	Replace Output Fuse – see Maintenance for value.
	Mains Power Not ON.	Turn ON Mains Power.
No Output Power to the Actuator in Power FAIL Mode.	Blown internal Output Fuse.	Replace Output Fuse – see Maintenance for value.
	Internal Failure of Backup Module.	Call Indelac for Service.

NOTES

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