INDELAC

CONTROLS, INC.

Safe & Secure Series Electric Actuator with Internal Battery Back-up

Installation, Operation & Maintenance Manual

For Use with:
SNS4, SNS6, SNS10 & SNS15 Models

Additional supplements may be needed for selected optional equipment including, but not limited to models with: timers, speed controllers & remote/off/local controls.

MSNS415-250829

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For a digital copy of this manual, access to training videos, access to 3D product renderings, or to request additional support
VISIT OUR WEBSITE AT WWW.INDELAC.COM

INTRODUCTION:

Thank you for selecting Indelac Controls, Inc. (*ICI*) for your valve or damper automation requirement. 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.

STORAGE:

If the actuators are scheduled for installation at a later date:

1. Store off the floor in a clean dry area.
2. Store in a climate controlled building.
3. See the Battery Maintenance Section in this Manual for proper battery storage.

FOR FUTURE REFERENCE RECORD:

1. Actuator model number_____
2. Actuator enclosure type NEMA 4__, NEMA 4X_, NEMA 7_, NEMA 4 & 7__
3. Actuator output torque: _____ LB-IN
4. Motor characteristics, Voltage_____ AC or DC_____ HZ_____
5. Actuator serial number_____
6. Date of installation_____Put into operation_____
7. Valve Data:
   - 7a. Manufacturer_____
   - 7b. Style & fig. No._____
   - 7c. Size_____
   - 7d. End connection_____
   - 7e. Material of construction, Body_____Stem & ball_____
   - 7f. Brake away torque_____LB-IN @_____PSI
   - 7g. Other helpful data_____

     _____

MEDIA:

1. System media_____
2. Temperature,_____(deg. F.) Maximum,_____. Minimum,_____.
3. Pressure_____PSI

**It is important to pay attention to all of the actuator specifications relative to the valve specifications and system requirements. If the actuator is not properly sized for the valve and application, the life will be shortened or it may not work at all.*

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TOOLS REQUIRED:

**ADDITIONAL TOOLS WILL BE REQUIRED FOR THE SCREWS TO MOUNT THE VALVE TO THE ACTUATOR.*

SNS4 – 15 SERIES

Cover Screws	7/16" Socket.
Terminal Strip Screws	3/16" Wide Flat Head Screwdriver.
Cam Set Screw	5/64" Allen Wrench.
Mounting Pad Screws	½" Socket.

SUGGESTED MAXIMUM TORQUE VALUES FOR FASTENERS (IN-LBS.)

SCREW SIZE	LOW CARBON STEEL	18-8 SS	316 SS	ALUMINUM
2-56	2.2	2.5	2.6	1.4
4-40	4.7	5.2	5.5	2.9
6-32	9	10	10	5
8-32	18	20	21	10
10-24	21	23	24	13
10.32	30	32	33	19
¼-20	65	75	79	45
5/16-18	129	132	138	80
3/8-16	212	236	247	143
½-13	465	517	542	313
5/8-11	1000	1110	1160	715

** Wiring Terminal Block Screws – tighten to 3.6 in/lbs. torque!

SNS4-15 Series Actuator

PRODUCT DESCRIPTION:

The SNS4-15 Safe & Secure Series Actuator is a quarter turn Open/Close Actuator with Battery Backup Power – ***ALL IN ONE!*** No more mounting a separate Fail Safe Unit to provide power in case of external power failure. The actuator's internal battery will provide power to the motor in the event of an external power failure. The actuator can be configured in the field for FAIL OPEN, FAIL CLOSE or Continue to run upon power failure (run time is dependent on size of actuator and torque load – see additional data below).

This series of actuator can operate loads from 400 in/lbs. to 1500 in/lbs. These actuators can be ordered to operate on input voltages of 115vac, 230vac, 24vac, 24vdc or 12vdc and are enclosed in a standard "M" series NEMA 7 type housing.

Switching from external power to battery power is seamless – when the external power source fails, the internal transfer circuit switches to battery power automatically without any operator intervention. Depending on the fail setting that the operator made for the actuator, the actuator will drive the valve to that position. Once the external power is restored, the actuator will automatically switch back to external power and the battery will begin to re-charge automatically! The actuator will then return to its last position before the power had failed.

This unit is available as a Standard OPEN/CLOSE Actuator or with the Modulating Option for precise valve position control using 4-20mA, 0-10V or 1-5V external input signal. Position Feedback is available for both the standard and modulating models.

A variety of other features are available for these actuators including but not limited to: Auxiliary Limit Switches, Mechanical Friction Brake, Additional Conduit Entries, Mechanical Stops, Temperature and Condensation Controls. *Speed Controls & Timers are available mounted in a separate enclosure.*

⚠WARNING!

THIS ACTUATOR IS INTENDED TO BE USED AS DESCRIBED IN THIS MANUAL BY INDELAC CONTROLS. IF USED FOR ANY OTHER PURPOSES OTHER THAN SPECIFIED HERE, SEVERE DAMAGE COULD OCCUR TO THIS PRODUCT AND ANY OTHER PRODUCTS CONNECTED TO IT.

UNIT SPECIFICATIONS:

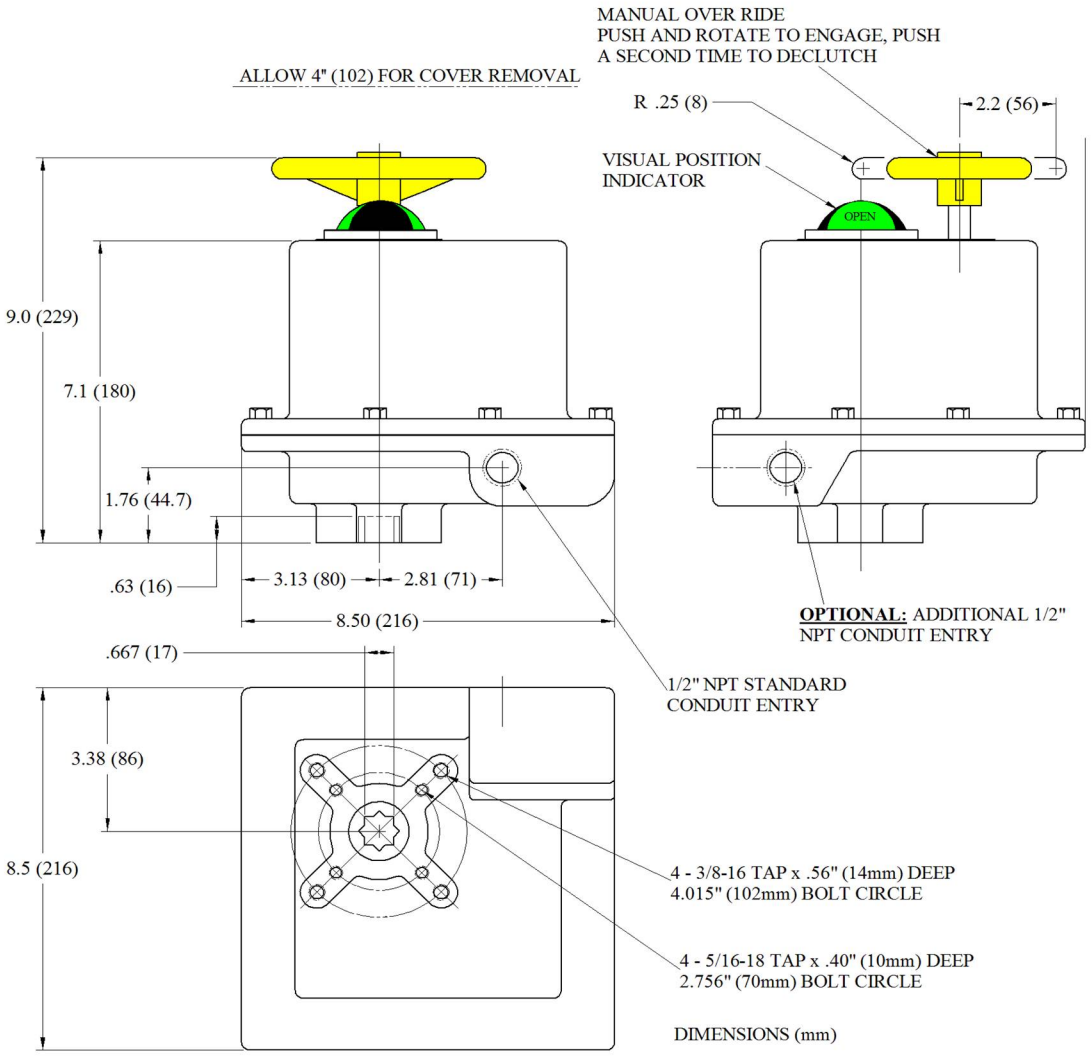
Actuator Model	Full Load Amps	Locked Rotor Amps	Power, Max Watts	Minimum Mains Wire (300V @ 105°C)
SNS4 & SNS6 – 230vac	0.09	0.22	21	18 AWG
SNS4 & SNS6 – 115vac	0.20	0.44	23	18 AWG
SNS4 & SNS6 - 24vac/dc	0.83	2.10	20	18 AWG (90 ft Max)
SNS4 & SNS6 – 12vdc	1.65	4.20	20	18 AWG (20 ft Max)
SNS10 & SNS15 – 230vac	0.12	0.22	28	18 AWG
SNS10 & SNS15 – 115vac	0.24	0.44	28	18 AWG
SNS10 & SNS15 – 24vac/dc	1.15	2.10	28	18 AWG (60 ft Max)
SNS10 & SNS15 – 12vdc	2.30	4.20	28	18 AWG (15 ft Max)

**** Maximum Mains Wire AWG = 12 AWG** (300V @ 105°C) – Terminal Block Max Wire Diameter

Enclosure rating:	NEMA 4 Standard; NEMA 4X & NEMA 7 also available
Standard Actuator Torque:	**SNS4** = 400 in/lbs. **SNS10** = 1000 in/lbs.
	SNS6 = 600 in/lbs. **SNS15** = 1500 in/lbs.
Cycle Time:	**SNS4** = 10 seconds / 90° **SNS10** = 15 seconds / 90°
	SNS6 = 15 seconds / 90° **SNS15** = 30 seconds / 90°
Motor Duty Cycle:	100% Standard (at 100% ambient temperature @ rated torque)
Weight:	18 Lbs.
Mounting Pad:	ISO 5211 F07
Incoming Power Fuse:	TR5 Pico Fuse, 250V / 115vac & 230vac = 500mA; 24vac = 3.15A
Motor Fuse:	6A PTC Automatic Resettable (soldered to PCB)
Optional Heater Power:	Add 20 Watts for optional heater
Position Indication:	Dome Style Visual Indicator and wired for Light Indication
Internal Battery:	12vdc, 0.8Ahr Sealed Lead Acid (SLA), Rechargeable
Battery Recharge Time:	Approximately 8 Hours
Battery Life on Trickle Charge:	4-5 years
Auxiliary Switch Rating:	Dry Contact, 10 Amps @ 250vac, Maximum
Feedback Indicator Output:	12vdc @ 100mA max.
Input Signal Contact Rating:	12vdc @ 3A (**Dry Contact ONLY** – NO External Voltage)
Operating Temperatures:	-40°F to 150°F (-40°C to 65°C); ***Heater required below 0°F***

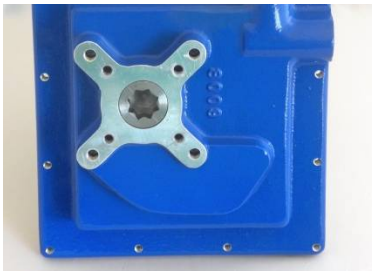
MECHANICAL MOUNTING:

The Safe & Secure Actuator can be direct mounted to any valve using the standard ISO 5211 F07 Output. Optional Inserts are available for ISO 5211 F03 and ISO 5211 F04. See the drawing below for the actuator output mounting dimensions for valves requiring mounting hardware.



Reference Image:
Actuator mounted to sample ball valve.

Actuator Bottom View

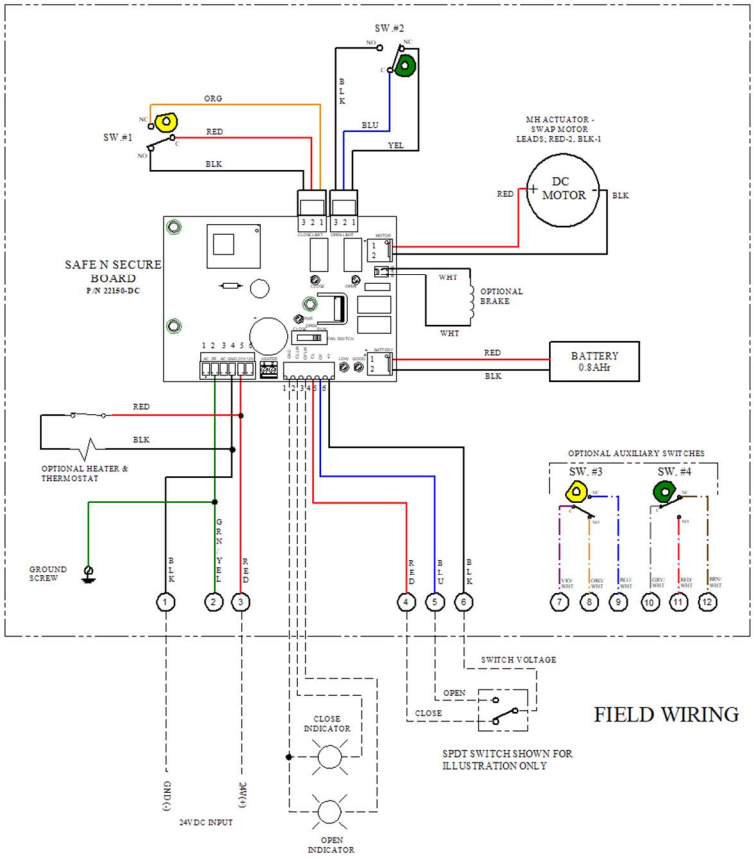


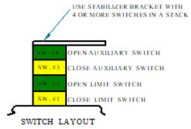
CUSTOMER ELECTRICAL CONNECTIONS FOR STANDARD OPEN/CLOSE:

All customer electrical connections are done per the below wiring diagrams. Incoming power should be wired using the wire gauge chart in the Specifications Section on Page 6. Control signal wiring may be 18awg or larger for direction control. All wiring is to be completed through the ¾" NPT conduit opening using the appropriate conduit – **Refer to your local electrical codes – Class 1 Wiring**. ***Remove the Plastic Conduit Hole Plug from the Conduit Entry Hole and Discard – this is a temporary protector for shipping only.*** Next, remove the actuator cover by loosening the cover screws and pulling straight up on the cover to complete the wiring and set-up. Assure that all power is DE-ENERGIZED when making the wiring connections. Connect the Main Power to the actuator per the appropriate wiring diagram below. Do not energize power to the actuator until the set up steps have been completed. When re-installing the actuator cover, pay close attention to the wiring and **make sure that none of the wires get pinched or damaged.**

WARNING!

Pay close attention to the Wiring Diagrams when connecting the input power to the actuator. Improper power connection can result in damage to the actuator or serious injury to the installer.





ACTUATOR SHOWN IN OPEN POSITION

NOTES:
1) CONTROL CAN OPERATE WITH 24VDC INPUT. INPUT POWER SOURCE TO BE @ 3.5A MINIMUM (INCLUDES HEATER).
2) UNIT IS SHIPPED WITHOUT THE BATTERY PLUGGED IN. AFTER INSTALLING UNIT AND CONNECTING INCOMING POWER, PLUG BATTERY CONNECTOR INTO THE SAFE N SECURE BOARD, J1.
3) CAMS FOR LIMIT SWITCHES ARE PRESET AT THE FACTORY. TO INCREASE OR DECREASE VALVE MOTION, THE CAMS CAN BE ADJUSTED SLIGHTLY.
4) THE FAIL SWITCH NEEDS TO BE SET IN THE "RUN", "OPEN" OR "CLOSE" POSITION PRIOR TO INSTALLING THE COVER. WHEN INCOMING POWER FAILS:
"RUN" = ACTUATOR WILL CONTINUE TO RUN WITH USER COMMAND SIGNAL UNTIL BATTERY DIES.
"OPEN" = ACTUATOR WILL MOVE TO THE OPEN POSITION.
"CLOSE" = ACTUATOR WILL MOVE TO THE CLOSE POSITION.
5) INDICATOR LAMPS NEED TO BE +12VDC ONLY. NEGATIVE OF LAMP IS CONNECTED TO PIN 1 OF J6.
6) COMMAND SIGNAL USES A SINGLE POLE, DOUBLE THROW CONTACT (RELAY OR SWITCH) RATED FOR 3AMPS OR MORE. **DO NOT CONNECT EXTERNAL VOLTAGE.** WHEN THE COMMAND SIGNAL IS DELIVERED, THE OPEN OR CLOSED LED SHOULD LIGHT TO INDICATE THE MOTION OF THE ACTUATOR.
7) WHEN INCOMING POWER IS PRESENT, BLUE LED WILL BE LIT AND ACTUATOR RUNS OFF OF INCOMING POWER. WHEN INCOMING POWER FAILS, BLUE LED WILL TURN OFF AND THE GREEN BATTERY LED WILL LIGHT
- ACTUATOR WILL NOW RUN OFF OF BATTERY POWER UNTIL INCOMING POWER IS RESTORED.
8) RED LED WILL LIGHT WHEN BATTERY VOLTAGE GETS TOO LOW.

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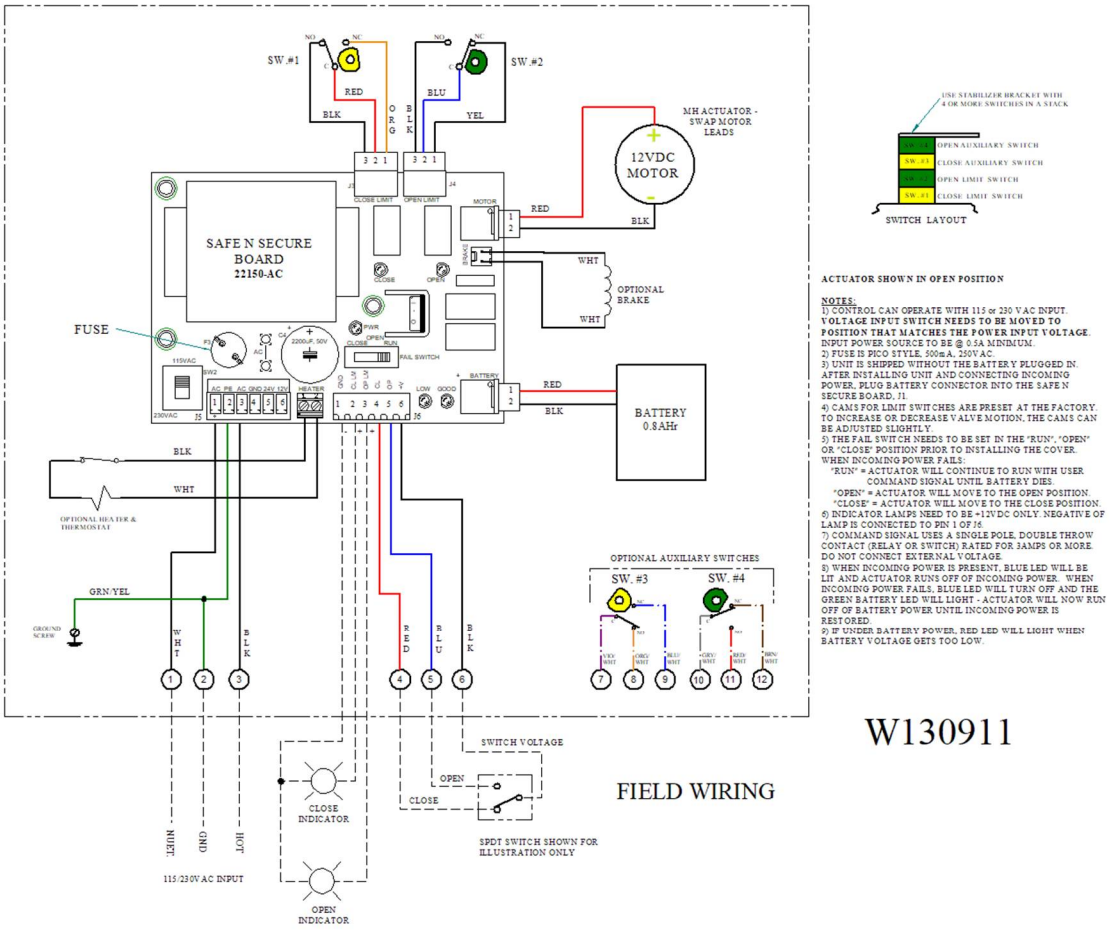
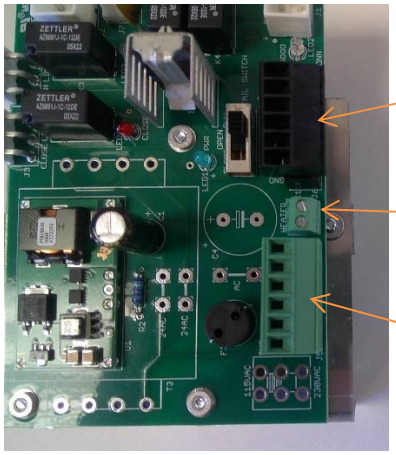
24VDC CONNECTION WIRING DIAGRAM



230/115VAC CONNECTION WIRING DIAGRAM



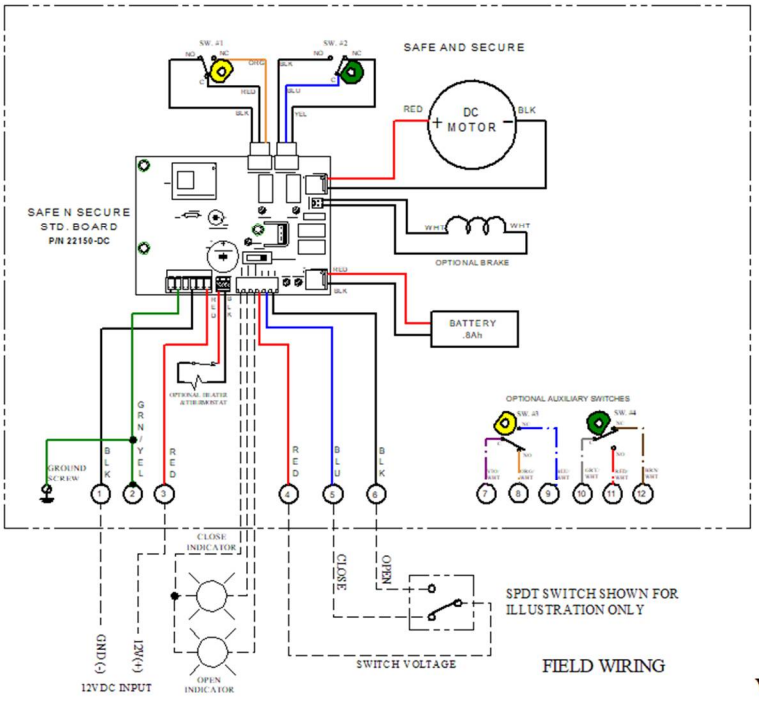
J6, Customer Connections – Pin 1 towards bottom

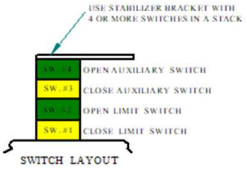
Heater Connector – AC Boards ONLY.

J5, Power Input Connections – Pin 1 towards bottom

Board Connector View

NOTE: Make sure the connectors are fully seated after making any wiring connections.





ACTUATOR SHOWN IN OPEN POSITION

NOTES:

1) CONTROL CAN OPERATE WITH 12VDC INPUT. INPUT POWER SOURCE TO BE @ 5.0A MINIMUM (INCLUDES HEATER).
2) UNIT IS SHIPPED WITHOUT THE BATTERY PLUGGED IN. AFTER INSTALLING UNIT AND CONNECTING INCOMING POWER, PLUG BATTERY CONNECTOR INTO THE SAFE N SECURE BOARD, J1.
3) CAMS FOR LIMIT SWITCHES ARE PRESET AT THE FACTORY. TO INCREASE OR DECREASE VALVE MOTION, THE CAMS CAN BE ADJUSTED SLIGHTLY.
4) THE FAIL SWITCH NEEDS TO BE SET IN THE "RUN", "OPEN" OR "CLOSE" POSITION PRIOR TO INSTALLING THE COVER. WHEN INCOMING POWER FAILS:
   "RUN" = ACTUATOR WILL CONTINUE TO RUN WITH USER COMMAND SIGNAL UNTIL BATTERY DIES.
   "OPEN" = ACTUATOR WILL MOVE TO THE OPEN POSITION.
   "CLOSE" = ACTUATOR WILL MOVE TO THE CLOSE POSITION.
5) INDICATOR LAMPS NEED TO BE +12VDC ONLY. NEGATIVE OF LAMP IS CONNECTED TO PIN 1 OF J6.
6) COMMAND SIGNAL USES A SINGLE POLE, DOUBLE THROW CONTACT (RELAY OR SWITCH) RATED FOR 3AMPS OR MORE. DO NOT CONNECT EXTERNAL VOLTAGE.
7) WHEN INCOMING POWER IS PRESENT, BLUE LED WILL BE LIT AND ACTUATOR RUNS OFF OF INCOMING POWER. WHEN INCOMING POWER FAILS, BLUE LED WILL TURN OFF AND THE GREEN BATTERY LED WILL LIGHT - ACTUATOR WILL NOW RUN OFF OF BATTERY POWER UNTIL INCOMING POWER IS RESTORED.
8) RED LED WILL LIGHT WHEN BATTERY VOLTAGE GETS TOO LOW.

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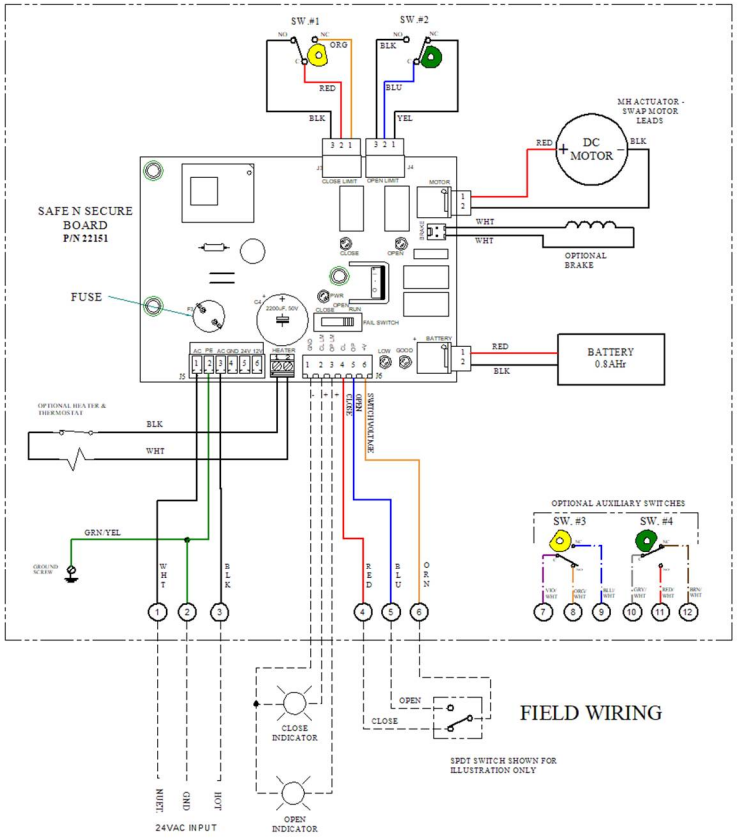
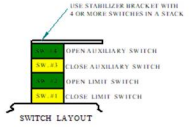
12VDC CONNECTION WIRING DIAGRAM





ACTUATOR SHOWN IN OPEN POSITION

NOTES:

1) INPUT POWER TO BE 24VAC @ 3A MINIMUM.
2) FUSE IS PICO STYLE, 3.15A, 250VAC.
3) UNIT IS SHIPPED WITHOUT THE BATTERY PLUGGED IN. AFTER INSTALLING UNIT AND CONNECTING INCOMING POWER, PLUG BATTERY CONNECTOR INTO THE SAFE N SECURE BOARD, J1.
4) CAMS FOR LIMIT SWITCHES ARE PRESET AT THE FACTORY. TO INCREASE OR DECREASE VALVE MOTION, THE CAMS CAN BE ADJUSTED SLIGHTLY.
5) THE FAIL SWITCH NEEDS TO BE SET IN THE "RUN", "OPEN" OR "CLOSE" POSITION PRIOR TO INSTALLING THE COVER. WHEN INCOMING POWER FAILS:
   "RUN" = ACTUATOR WILL CONTINUE TO RUN WITH USER COMMAND SIGNAL UNTIL BATTERY DIES.
   "OPEN" = ACTUATOR WILL MOVE TO THE OPEN POSITION.
   "CLOSE" = ACTUATOR WILL MOVE TO THE CLOSE POSITION.
6) INDICATOR LAMPS NEED TO BE +12VDC ONLY.
7) COMMAND SIGNAL USES A SINGLE POLE, DOUBLE THROW CONTACT (RELAY OR SWITCH) RATED FOR 3AMPS OR MORE. NO EXTERNAL VOLTAGE IS TO BE APPLIED TO THE SIGNAL INPUT PINS.
8) WHEN INCOMING POWER IS PRESENT, BLUE LED WILL BE LIT AND ACTUATOR RUNS OFF OF INCOMING POWER. WHEN INCOMING POWER FAILS, BLUE LED WILL TURN OFF AND THE GREEN BATTERY LED WILL LIGHT - ACTUATOR WILL NOW RUN OFF OF BATTERY POWER UNTIL INCOMING POWER IS RESTORED.
9) RED LED WILL LIGHT WHEN BATTERY VOLTAGE GETS TOO LOW.

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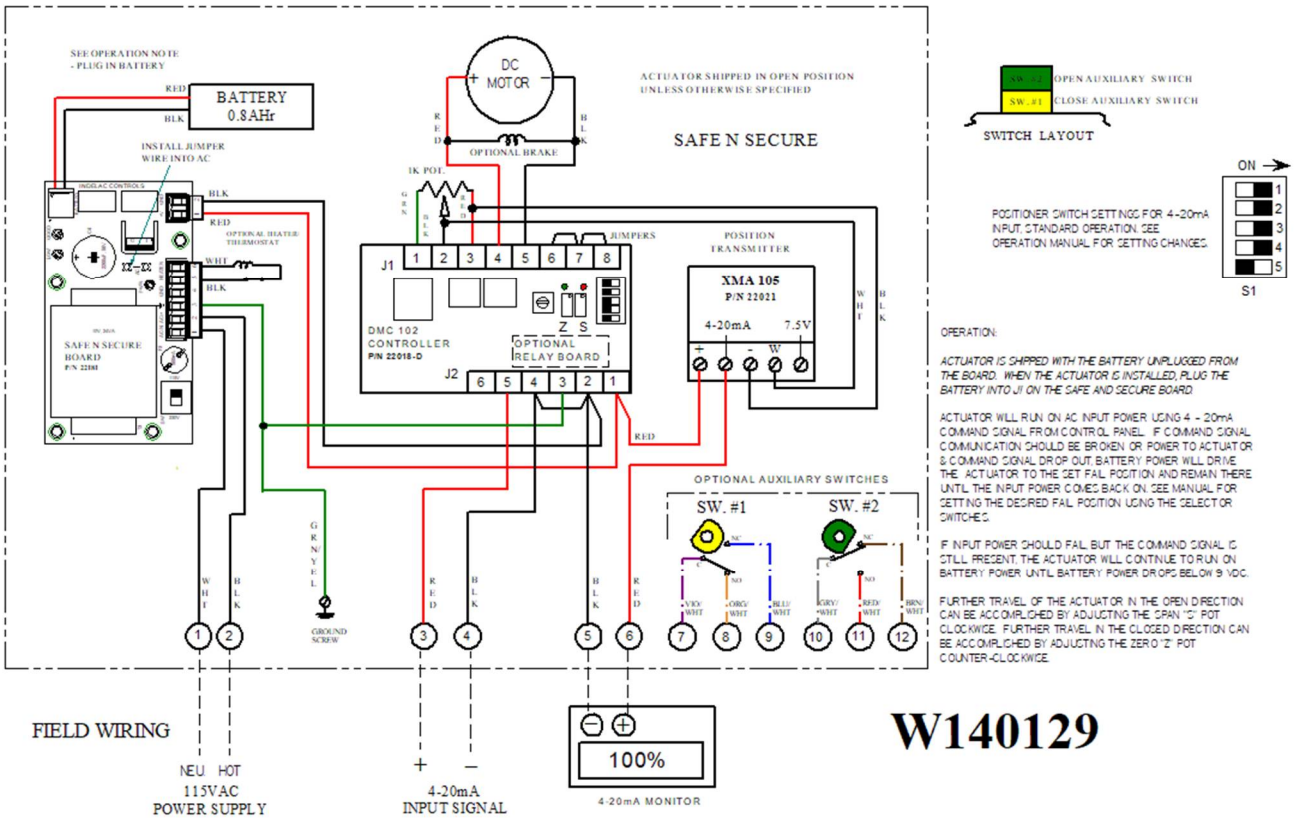
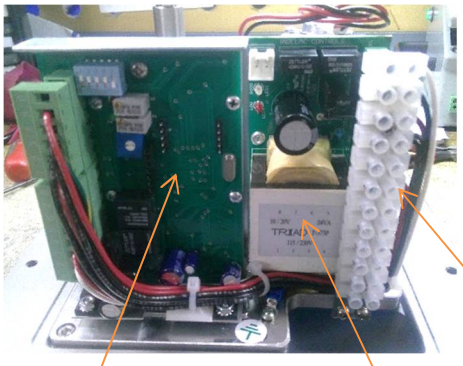
24VAC CONNECTION WIRING DIAGRAM

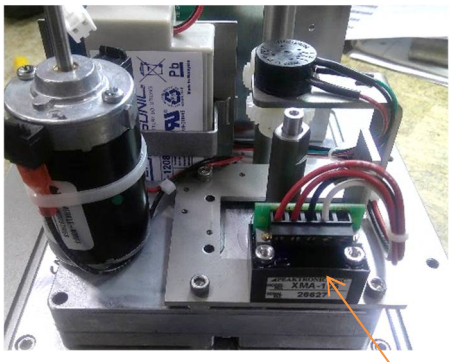
CUSTOMER ELECTRICAL CONNECTIONS FOR MODULATING OPTION:



230/115VAC CONNECTION WITH 4-20mA CONTROL & TRANSMITTER WIRING DIAGRAM

NOTE: Make sure the connectors are fully seated after making all wiring connections.



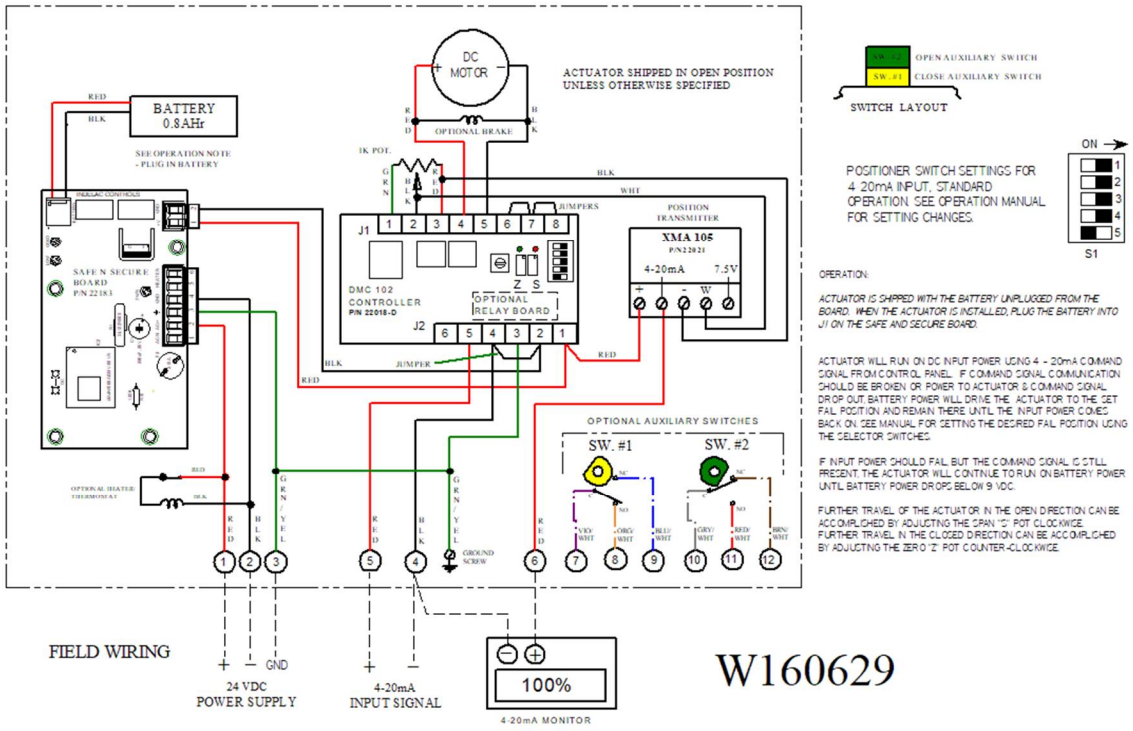


4-20Ma CONTROL BOARD

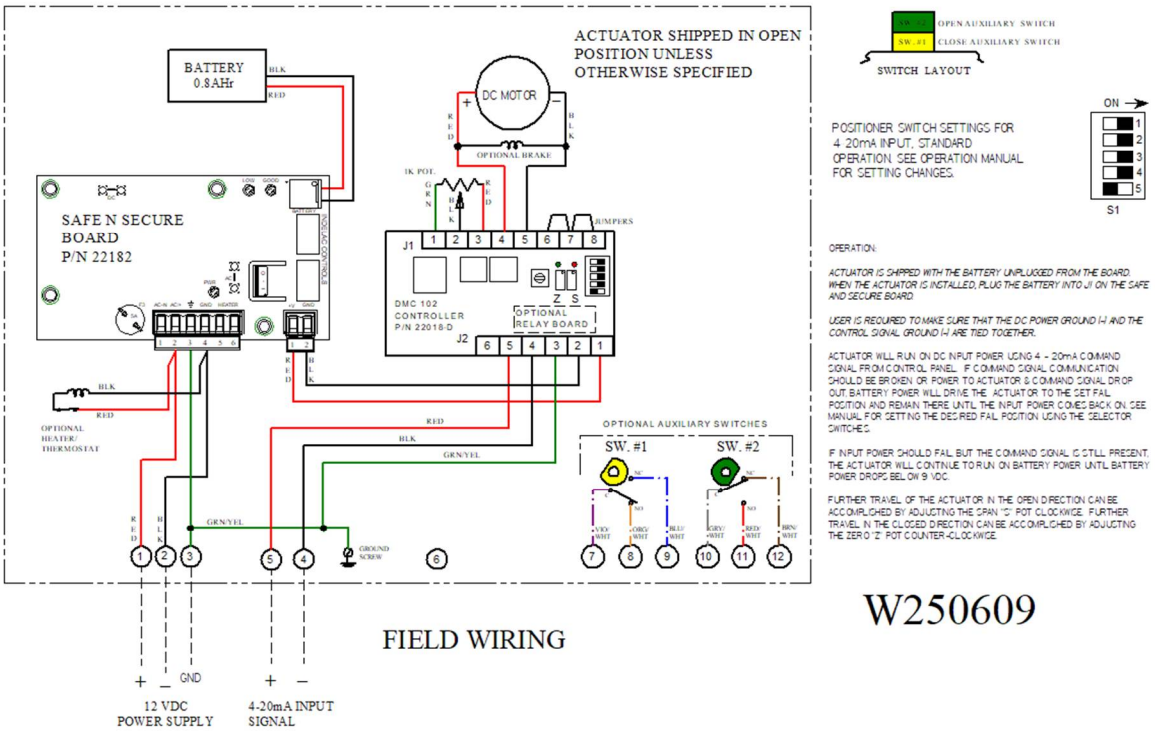
AC SNS-VP BOARD

CONNECTION TERMINAL BLOCK

TRANSMITTER MODULE



24VDC CONNECTION WITH 4-20mA CONTROL & TRANSMITTER WIRING



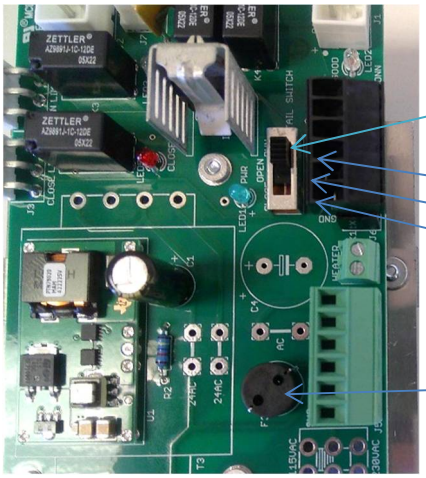
12VDC CONNECTION WITH 4-20mA CONTROL WIRING DIAGRAM

ACTUATOR SET-UP FOR STANDARD OPEN/CLOSE ACTUATOR:

After the actuator is mounted mechanically to the valve and the external electrical wiring is complete, the actuator is ready for set up. The actuator cover will need to be removed, if not already done so.

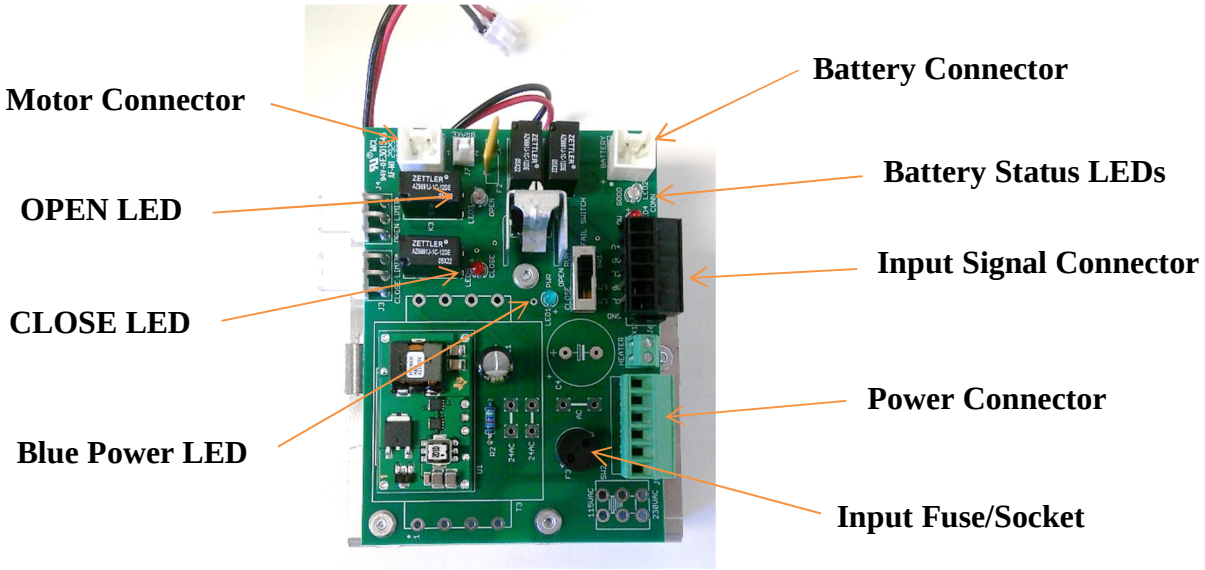
1) On the circuit board, move the "Fail Switch" to the desired "FAIL" position. The description of the 3 positions are as follows:

RUN = ACTUATOR WILL CONTINUE TO RUN WITH USER COMMAND SIGNAL WHEN POWER FAILS UNTIL THE BATTERY DIES.
OPEN = ACTUATOR WILL MOVE TO THE OPEN POSITION WHEN POWER FAILS.
CLOSE = ACTUATOR WILL MOVE TO THE CLOSE POSITION WHEN POWER FAILS.



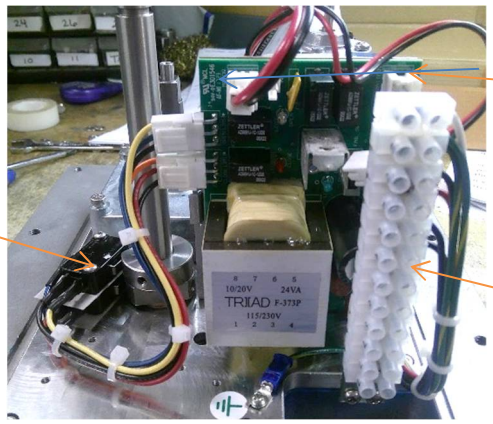
**** DO NOT slide the FAIL switch while the actuator is moving – Turn OFF power before moving switch!**

2) Plug the battery connector into the circuit board at position J1. **NOTE:** If the "Fail Switch" was moved to the "CLOSE" position, the actuator will begin to move to the **Close location**.



DC SNS Board (full view)

Limit Switch CAMs (Bottom = Close; Top = Open) – Loosen the set screw to rotate for adjustment.

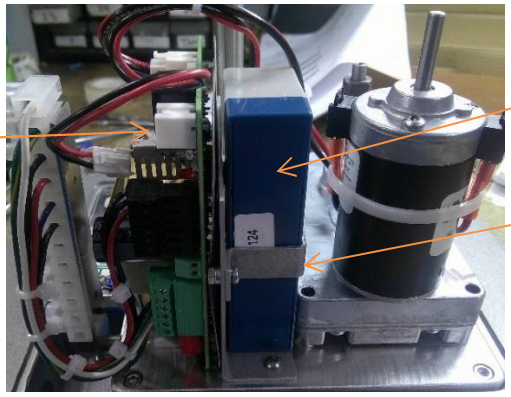


J1, Battery Connector – Plug the battery into the J1 Connector on the board

Input Connector

3) Apply external power to the actuator. The Blue Power LED should turn ON to indicate Main Power is ON and the Input Fuse is good.
4) Apply the external direction control signal by connecting terminal #6 to #4 to CLOSE and to terminal #6 to #5 to OPEN. Only apply the signal to OPEN or CLOSE individually and NOT at the same time. **Applying the control to the OPEN and CLOSE at the same time will damage the circuit board and the motor**. Also, do not apply an external voltage to the OPEN or CLOSE control signal pins – this will damage the circuitry. The +12vdc voltage on terminal #6 should be the only voltage applied to terminals #4 or #5 for controlling the actuator.

Battery Cable – Plug the battery cable into the J1 Connector on the board



Battery, 0.8Ahr, 12vdc

Battery Mounting Strap Bracket

5) Using the external direction control signal, run the actuator OPEN and CLOSE to verify that the valve is opening and closing fully. If not, the Open and Close CAMs may be adjusted to allow more or less motion in both directions. Rotate the CAM Clockwise for less rotation (shorten the valve stroke); Counter Clock Wise for more rotation (increase the valve stroke – further into the seat). The CAM set screw needs to be loosened to rotate the CAM. Re-tighten the set screw when the desired valve position is achieved.

NOTE: If control signal is provided by a PLC relay, program needs to incorporate a delay between the OPEN & CLOSE signal to prevent Back EMF damage to the PC Board.

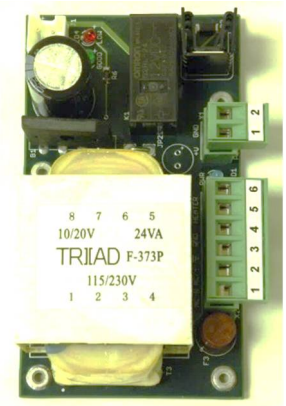
The external control signal is done using a dry contact switch or relay. DO NOT APPLY an External voltage to the OPEN or CLOSED control signal pins. The voltage is provided on terminal #6 via the SNS control board.

ACTUATOR SET-UP FOR MODULATING ACTUATOR:

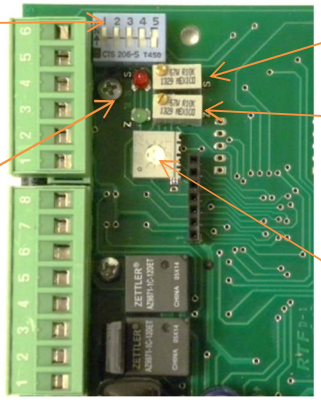
After the actuator is mounted mechanically to the valve and the external electrical wiring is complete, the actuator is ready for set up. The actuator cover will need to be removed, if not already done so.

1) The Safe & Secure board will supply power to the Modulating Controller Board. When the incoming power to the unit fails, the battery will supply power to the Controller Board which will run the motor to the selected FAIL position that is set on the Positioner Board.

Safe and Secure Board



DC Modulating Controller



Fail Dip Switches

Span Pot

Zero Pot

Green & Red LEDs – close and open indicators

Deadband Pot

2) Set the DIP Switch #3 to ON (up) & #4 to OFF (down) on the DMC 102 Controller Board. This will run the actuator to the CLOSED position in the event of a **loss of input control signal**. If it is desired to have the actuator go to the OPEN position when the input signal is lost, then DIP Switch #3 is set to OFF (down) & #4 is set to ON (up). Refer to the chart below for setting details.

**DO NOT CHANGE THESE SWITCH SETTINGS WITH THE POWER ON!

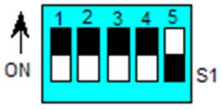
S1

COMMAND INPUT SIGNAL CONFIGURATION

COMMAND TYPE	SW1	SW2	SW3	SW4	LOSS OF COMMAND OPERATION
4-20mA	ON	ON	ON	ON	Motor off
			ON	OFF	Close (Zero setting)
			OFF	ON	Open (Span setting)
1-5V	OFF	ON	ON	ON	Motor off
			ON	OFF	Close (Zero setting)
			OFF	ON	Open (Span setting)
2-10V	OFF	OFF	ON	ON	Motor off
			ON	OFF	Close (Zero setting)
			OFF	ON	Open (Span setting)
0-5V	OFF	ON	OFF	OFF	NA
0-10V	OFF	OFF	OFF	OFF	NA

NOTE: All other settings are not valid and can cause abnormal operation.

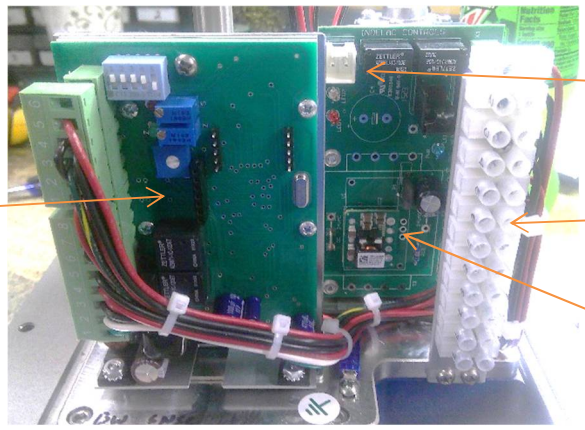
CONTROL FUNCTION	SW5
Calibrate/Normal	OFF
Log Rate	ON



Switch settings for Standard 4-20mA Input with FAIL In Place Option

NOTE: If the incoming power should fail, the battery will supply the Controller board and the actuator will operate normally as long as the input signal is present. The actuator will operate until the battery loses power. If the input signal should fail **along with** the incoming power, the Controller Board will drive the actuator to the selected FAIL Position on battery power and remain until power & signal are restored.

3) Plug the battery connector into the circuit board at position J1.

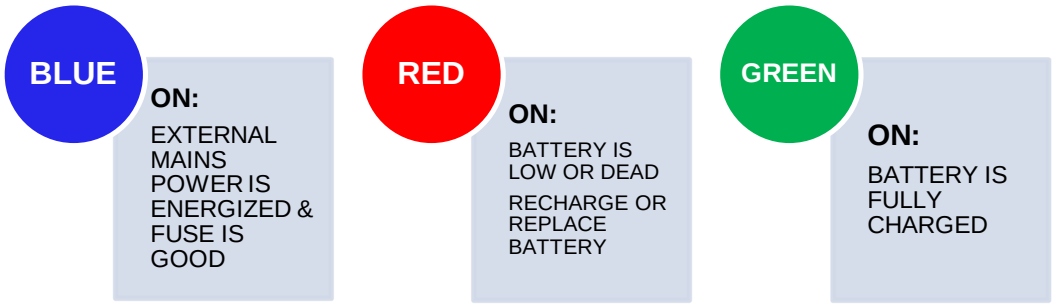


4) Apply external power to the actuator and the Blue Power LED should turn ON.
5) Apply the input signal (4-20mA, 0-10v, etc.) to run the actuator open and closed to verify that the valve is opening and closing fully. If not, the ZERO and SPAN pots on the Controller Board may be adjusted to allow more or less motion in both directions.
6) If the actuator will NOT react properly or move in the correct direction, see the **Modulating Board Calibration Procedure** Section.
7) Re-install the Actuator Cover and tighten the Cover bolts to the proper torque.

NOTE: When re-installing the actuator cover, pay close attention to the wiring and make sure that none of the wires get pinched or damaged.

STANDARD OPEN/CLOSE OPERATION:

Upon applying external supply power to the actuator, the Blue LED on the Safe & Secure Board should illuminate indicating that the power from the external source is on. See picture above for LED location. When the external power fails, the Blue LED will turn off and the Battery Status Green LED will illuminate indicating that the actuator is now running on battery power. When this occurs, the actuator will move to the desired position (RUN, OPEN or CLOSED), as selected by the operator during set-up.



For example, if the actuator is moving towards the Open position with the Fail Switch set for CLOSED, the actuator will STOP and move to the Closed position if the external power should fail.

WARNING: DO NOT CHANGE THE FAIL SWITCH SETTING WITH THE POWER ON!! POWER OFF BEFORE CHANGING ANY SWITCH SETTINGS!

If the Green Battery Status LED is on, the battery is at full power, but if the Red LED is illuminated, the battery power is low and will need to be charged. If neither the Green nor Red LED is lit under battery power, the battery is completely dead and will need to be replaced. **If the battery is too low, the actuator will FAIL in place.**

The unit will indicate direction of operation (OPEN or CLOSE) by lighting the OPEN (Green) or CLOSE (Red) LED. If, for instance, an OPEN signal is delivered to the actuator, the OPEN Green LED should turn on and the actuator should move to the OPEN position. If that Green LED turns on and the motor does not move, then the Motor PTC Fuse has blown or there is a problem with the PC Board. When the Full OPEN or Full CLOSE Position has been reached, the corresponding Limit Switch will trip to stop the Motor and the OPEN (Green) or CLOSE (Red) LED will Turn OFF.

The Actuator operates when the internal +12vdc Signal Power (Terminal #6) is connected to the OPEN Terminal #5 or the CLOSE Terminal #4. **DO NOT** apply an **External Voltage** to the Control Signal Terminals – this will damage the PCB. Only one signal can be powered at a time – **DO NOT Connect Terminal #6 to Terminal #4 AND #5 at the same time!**

There is a battery charge circuit built into the Safe & Secure actuator that will charge the battery when the external power is on. After a full 8-10 hour charge, the Green battery status LED will illuminate. If after 8-10 hours of "on board" charging, the Red LED remains on, then the battery needs to be replaced. IF the battery needs to be replaced, see the **BATTERY OPERATION, INSTALLATION & MAINTENANCE SECTION**. The battery charge circuit will complete the "boost" charge on the battery until it reaches a "Fully Charged" level then it will go into a "Trickle" charge mode. This will maintain the battery until it is needed again.

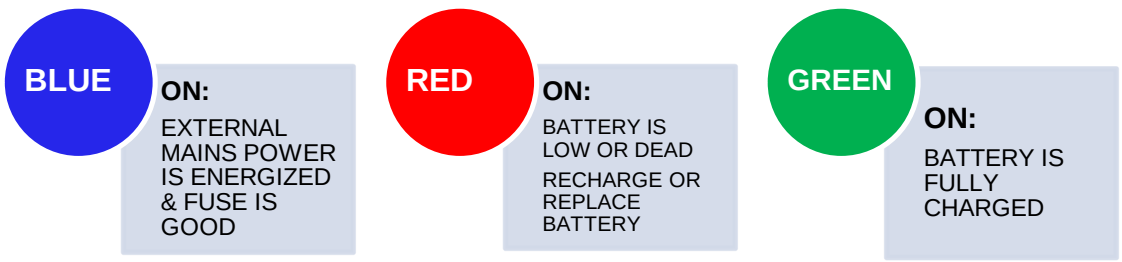
If the Optional Heater has been installed, the Heater will operate when the external power supply is on. **BE CAREFUL: The Heater will be HOT!** If the external power supply should fail and the actuator runs on battery power, the Heater will **NOT** be operational.

The Actuator Cover will need to be removed to Observe the Status LEDs as described in this **OPERATION** Section. Please see the photos in the previous pages of this manual for the locations of the above mentioned boards and LED locations.

NOTE: When re-installing the actuator cover, pay close attention to the wiring and make sure that none of the wires get pinched or damaged.

MODULATING ACTUATOR OPERATION:

Modulating Actuators allow the User to *precisely* position the actuator/valve to control flows and processes using an adjustable input signal. Upon applying external Mains Power to the actuator, the Blue LED on the Safe & Secure Board should illuminate indicating that the power from the external source is on and the input fuse is good. When the incoming power fails, the Blue LED on the SNS Board will turn OFF and one of the Battery Status LEDs will turn ON (Green or Red).



On the Modulating version, the FAIL position is set by the DIP Switches on the Modulating Control Board as described in the **SET UP FOR MODULATING ACTUATORS** Section. The actuator will continue to operate from the input signal, as long as it is present. **Only when the input control signal fails, will the actuator move to the CLOSED or other set position.**

When the Input Control Signal FAILS, the Battery Power will drive the actuator to the User Selected Fail Position and remain there until the Control Signal is repaired.

WARNING: DO NOT CHANGE THE DIP SWITCH SETTING WITH THE POWER ON!! POWER OFF BEFORE CHANGING ANY SWITCH SETTINGS!

The Modulating version actuator is controlled by an external 4-20mA, 0-10vdc or 1-5vdc Control Signal. Indelac actuators are calibrated and adjusted to accept a 4mA signal for full CLOSE and a 20mA signal for full OPEN at the factory. Changes to the type of signal and Reverse Acting can be ordered Special or Set Up in the field using the Instructions in the 22108-D Manual. Any changes will require re-calibration of the Modulating Board. Remember: if the 0-10vdc or 1-5vdc Control Signal Option is selected, the Actuator will **ONLY FAIL IN PLACE** and not to the OPEN or CLOSE positions.

The Actuator will indicate OPEN and CLOSE motion by lighting the Red (OPEN) and Green (CLOSE) LEDs on the Modulating Control Board, 22018-D. The Actuator will precisely move the valve to the desired position as commanded by the Control Signal. When a 4mA Control Signal is delivered to the Actuator, the Green LED should turn ON and the actuator should move to the CLOSE position. Likewise, if a 20mA signal is delivered, the Red LED should turn ON and the Actuator should move to the OPEN position. If the Red or Green LED is ON and the actuator is not moving when a control signal is delivered, check the Calibration of the Actuator and OPEN/CLOSE CAMs for proper adjustments. The Actuator may need to be Re-calibrated if there is no movement when a Control Signal is delivered. See the **MODULATING BOARD CALIBRATION PROCEDURE** Section.

There is a battery charge circuit built into the Safe & Secure actuator that will charge the battery when the external power is ON. After a full 8-10 hour full charge, the Green battery status LED will illuminate. If after 8-10 hours of “on board” charging, the Red LED remains on, then the battery needs to be replaced. **If the battery is too low, the actuator will FAIL in place.**

If the Optional Heater has been installed, the Heater will operate when the external power supply is on. **BE CAREFUL: The Heater will be HOT!** If the external power supply should fail and the actuator runs on battery power, the Heater will **NOT** be operational.

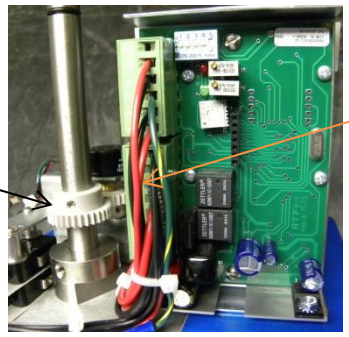
The Actuator Cover will need to be removed to Observe the Status LEDs as described in this **OPERATION** Section. Please see the photos in the previous pages of this manual for the locations of the above mentioned boards and LED locations.

NOTE: When re-installing the actuator cover, pay close attention to the wiring and make sure that none of the wires get pinched or damaged.

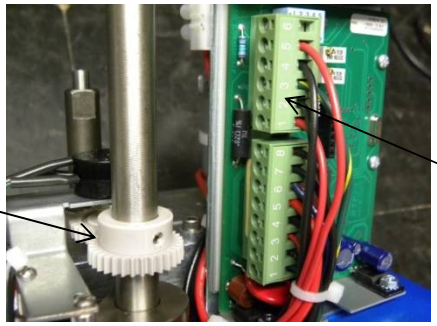
MODULATING BOARD CALIBRATION PROCEDURE:

If the SNS4-15 Modulating Actuator should not respond to the input signal properly, the unit may need to be recalibrated back to the factory settings. Follow the below steps to re-calibrate the unit.

1) Power the motor and valve to 45° or mid-position between open and close.
2) Turn the Mains power to the actuator OFF so that the motor does not move.
3) Loosen set screw on the potentiometer shaft gear.

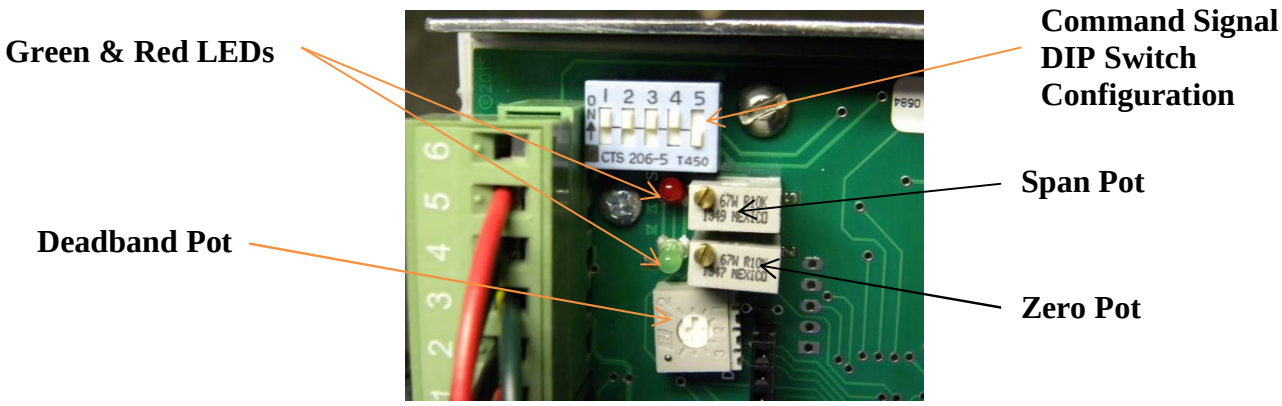


4) Pull the 8-terminal J1 green connector out away from the controller board so that the potentiometer is isolated from the circuit card.
5) Using a Digital Volt Meter (DVM), measure the resistance of the potentiometer between terminals 2 & 3 at the free hanging J1 connector.
6) Rotate the potentiometer shaft gear until the resistance reads approximately 500 ohms (+/-10).
7) Tighten down the potentiometer shaft gear set screw to lock the gear in place.
8) Push the green J1 connector back into the controller board.
9) Connect a User Control Signal (4-20mA, 0-10v, etc.) to the actuator input terminals on the white input terminal strip. The connections at J2 (6 Terminal Green Connector) are: terminal 4 = (-); terminal 5 = (+). Consult your actuator's wiring diagram for the proper terminal connections.



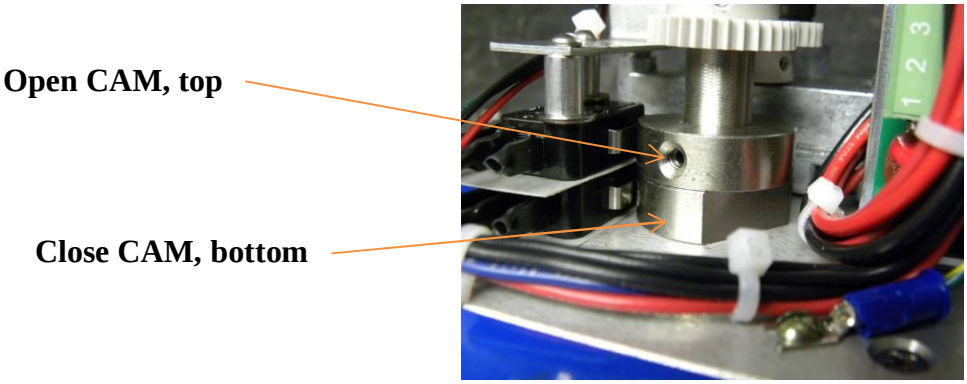
10) Cut the wire tie from around the motor and carefully pull the Red motor wire and connector off the "+" motor terminal. Pull aside so that it does not make contact with the motor or any metal parts.
11) Set the User Control Signal to the CLOSE level (0%) - 4.0mA or 0V.
12) Make sure the Deadband pot on the controller board is adjusted at mid position.

13) Turn the Mains power back ON to the actuator. Use **CAUTION** with the next few steps because power is present and an electrical shock is possible.
14) The Green LED on the board should come on. If not, adjust the Zero Pot until the Green LED illuminates.



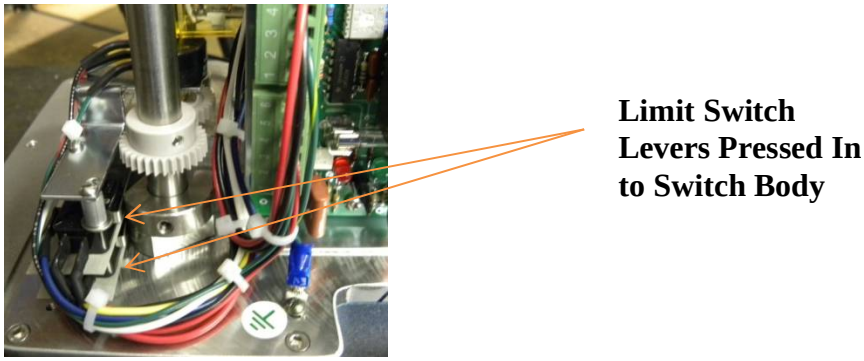
15) If any of the LEDs are blinking or flashing or there is a question regarding the setup of the Command Signal Configuration Switches, please see the Positioner Data Sheet.
16) Connect and lightly hold the Red motor wire onto the "+" motor terminal so that the valve moves in the CLOSE direction.
17) When the valve reaches the fully CLOSED position, remove the Red motor wire to stop the motor. If the valve does not reach the fully CLOSED position on the first adjustment, adjust the Zero Pot until full travel is reached.

18) If the Green LED turns ON and the motor does not move, check the bottom/CLOSE CAM to make sure that it is pressing the CLOSE switch lever into the body of the switch. The switch lever needs to be depressed to allow power to the motor. If it is not, adjust the CLOSE CAM accordingly.
19) Loosen the CAM set screw and rotate the CLOSE CAM so that it presses the CLOSE switch lever in towards the switch body. When set, re-tighten the CAM set screw.
20) Adjust the Zero Pot so that both the Green and Red LEDs are OFF.



21) With the Red motor wire still removed from the "+" motor terminal, set the User Control Signal to the OEPN level (100%) - 20.0mA or 10V.
22) The Red LED should turn on.
23) Connect and lightly hold the Red motor wire onto the "+" motor terminal so that the valve moves in the OPEN direction.
24) When the valve reaches the fully OPEN position, remove the Red motor wire to stop the motor. If the valve does not reach the fully OPEN position on the first adjustment, keep adjusting the Span Pot until full travel is reached.

25) If the Red LED turns ON and the motor does not move, check the top/OPEN CAM to make sure that it is pressing the OPEN switch lever into the body of the switch. The switch lever needs to be depressed to allow power to the motor. If it is not, adjust the OPEN CAM accordingly.
26) Loosen the CAM set screw and rotate the CLOSE CAM so that it presses the CLOSE switch lever in towards the switch body. When set, re-tighten the CAM set screw.
27) Adjust the Span Pot so that both the Green and Red LEDs are OFF.

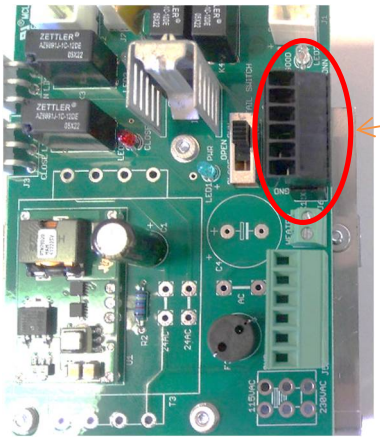


28) Reconnect the Red motor wire to the "+" motor terminal and make sure that it is fully seated on the terminal. Install a new wire tie to hold the motor leads from becoming disconnected.
29) Deliver OPEN, MID and CLOSE (0%, 50% & 100%) Control Signals a few times to verify that the valve travels to the proper positions. Adjust as described above, if further adjustments are needed.
30) Turn OFF the Mains Power and check that all of the set screws are tightened. Carefully replace the actuator cover and tighten the screws. Take care not to pinch or damage any wires with the cover.
31) Re-apply the Mains power to the actuator and re-check all of the settings.

NOTE: When re-installing the actuator cover, pay close attention to the wiring and make sure that none of the wires get pinched or damaged.

CONNECTIONS FOR LIGHT INDICATION:

There is a feature available on the SNS4-15 Series Actuator that provides connection for external light indication. This is ONLY available on the Standard OPEN/CLOSE Actuator Units and the Indicators **MUST BE 12VDC ONLY!** By connecting wires to the J6 Customer Connections Terminal Block on the SNS PCB, the user can connect 1 or 2 Light Indicators externally to determine when the actuator has reached the Full OPEN or Full CLOSED position from their Remote Control Panel.



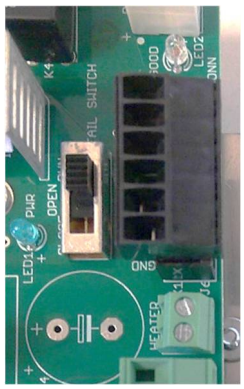
J6, Customer Connections Terminal Block – pin 1 towards bottom

Standard Open/Close SNS Board

NOTE: Verify that ALL Power is OFF to the Actuator prior to connecting any External Connection wiring for the Light Indication.

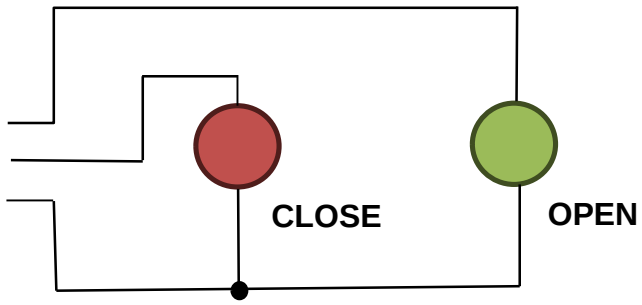
LIGHT INDICATOR CONNECTIONS:

Strip and terminate minimum 18awg wires into the following terminals shown in the diagram.
When the Actuator reaches the Full OPEN position, the OPEN FEEDBACK Indicator will light.
When the Actuator reaches the Full CLOSED position, the CLOSE FEEDBACK Indicator will light.



12vdc Indicators ONLY!

3 – + Open Feedback
2 – + Close Feedback
1 – Common Ground

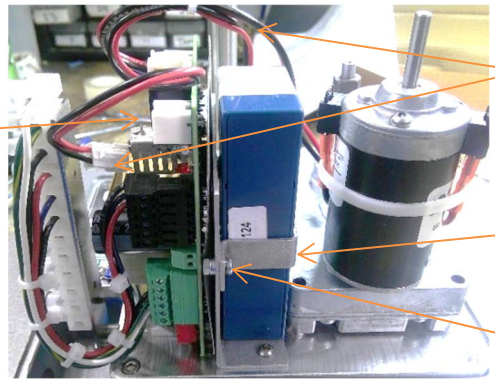


J6, Customer Connections Terminal Block, SNS4-15 PCB

BATTERY OPERATION, INSTALLATION & MAINTENANCE:

The battery **(#32001)** in the SNS4-15 is a Sealed Lead Acid, 12vdc, 0.8AHr Rechargeable Unit. The SNS4-15 is shipped with the battery connector disconnected, so there is no load on the battery. The actuator can be stored for 4-6 months in this "no load" condition before the battery will need to be recharged. If these actuators 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 needed.

***** Field Installation of the battery is ONLY permitted when the area is non-hazardous or known to be free of an ignitable concentration of hazardous materials.**



When **installing or replacing** a battery in the SNS4-15 Actuator, follow the below steps:

1) Turn OFF all power to the SNS Actuator.
2) Remove the Actuator Cover screws and remove the Actuator Cover.
3) Remove the new battery from the packaging and check for damage to the battery case, wiring and connector. DO NOT install a battery if there is obvious damage to these components!
4) Loosen the Battery Bracket Screw to pull the Battery Bracket out away from the SNS Board Support Bracket.
5) Slide the new Battery down into the Battery Bracket opening and re-tighten the Battery Bracket Screw to secure the battery in place.
6) Plug the 2 pin Battery Wire/Connector into J1 on the SNS Board. The Green LED on the ProVolt Board should illuminate. If the Red LED lights, the battery needS a slight charge.
7) Turn the Main Power back ON to the SNS Actuator and see that the Green or Red LED will turn OFF and the Blue LED will illuminate.
8) Turn the Main Power OFF.
9) Carefully replace the Actuator Cover without pinching any wires and tighten the Cover Screws to 75 in/lbs. torque.

The battery life is typically 4 years as long as kept on a maintenance/trickle charge. If the actuator is installed and the battery connector is plugged into the SNS PCB, J1, the Mains Power needs to be turned ON to the actuator to maintain the battery. The "on-board" trickle charger will maintain the battery for use when needed. If the Main Power is shut OFF or the Main Power Fuse blows, the actuator will be operating under battery power and illuminates the PCB LEDs. This will drain the battery over a shorter amount of time, and the Main Power needs to be repaired to power the actuator.

ATTENTION: The battery condition and charge level should be checked after installation of the unit and before putting the Actuator into service. Use an Electrical Meter to check the battery voltage AND with No Mains Power applied, verify that the Green Battery Status LED is illuminated.

Once the battery charge gets below 6-7vdc, it may not take a charge due to internal cell damage. To charge a battery that low, the "on board" trickle charger will not work. A larger charger, such as the **Indelac #33001**, will re-charge low batteries. Even if it does take a charge, the battery may be unreliable and **SHOULD be REPLACED**!

NOTE: Care should be used whenever using a battery source for power. Sealed Lead Acid (SLA) batteries are designed to be mounted in any position without leaking. Take great care NOT to pinch or crimp the battery wires with the Actuator Cover or brackets as this may cause damage and /or arching and short out the battery.

MOTOR OVERLOAD - FUSE:

The Safe and Secure series actuator motors are internally fused with a PTC resettable fuse. When the motor current rises to an overload level, the on-board fuse will "trip" until the motor cools down. The fuse will automatically reset and allow the actuator to resume operation. It is the responsibility of the operator to check the entire system and clear any jams or valve binding prior to restarting the system.

MECHANICAL OVER LOAD:

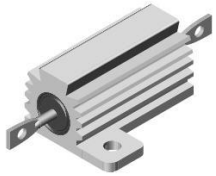
The SNS Series actuators are all designed to withstand stall conditions. It is not recommended to subject the unit to repeated stall conditions; however, should it occur the actuator would not experience gear damage.

SPARE PARTS:

The SNS4-15 Actuators require very little maintenance. If a failure should occur, a list of field replaceable parts is shown in the chart below. When calling for spare parts, please include your Model Number, Serial Number, Description and Date of Installation.

0.8Ahr SLA Battery w/Connector

Incoming Power Fuse TR5, AC ONLY



Heater

If the unit is not working and it is suspected that there is a failure in the Positioner Board, the SNS4-15 Actuator will need to be sent back to Indelac for repair and re-calibration.

Spare Part	Indelac Part Number
CLOSE Switch with wires	24000-C
OPEN Switch with wires	24000-O
Battery, 0.8AHr	32001
Fuse, 0.5A, 250V, TR5 – 115/230VAC Units	46029
Fuse, 3.15A, 250V, TR5 – 24VAC/DC Units	46028
SNS4-15 PCB, Standard, 115/230vac	22150-AC
SNS4-15 PCB, Standard, 12/24vdc	22150-DC
SNS4-15 PCB, Standard, 24vac	22151
SNS4-15 PCB, VP Version, 115/230vac	22181
SNS4-15 PCB, VP Version, 24vdc	22183
SNS4-15 PCB, VP Version, 12vdc	22182
DC Modulating Positioner Board	22018-D
Heater Kit, 115vac Units	90002-SNSH
Heater Kit, 230vac Units	90004-SNS
Heater Kit, 24vdc Units	90005-SNS
Heater Kit, 12vdc Units	90002-12SNS
Power Off Brake Kit, 12vdc	90016-D
Auxiliary Switch Kit, 2 Switches	90005-2S

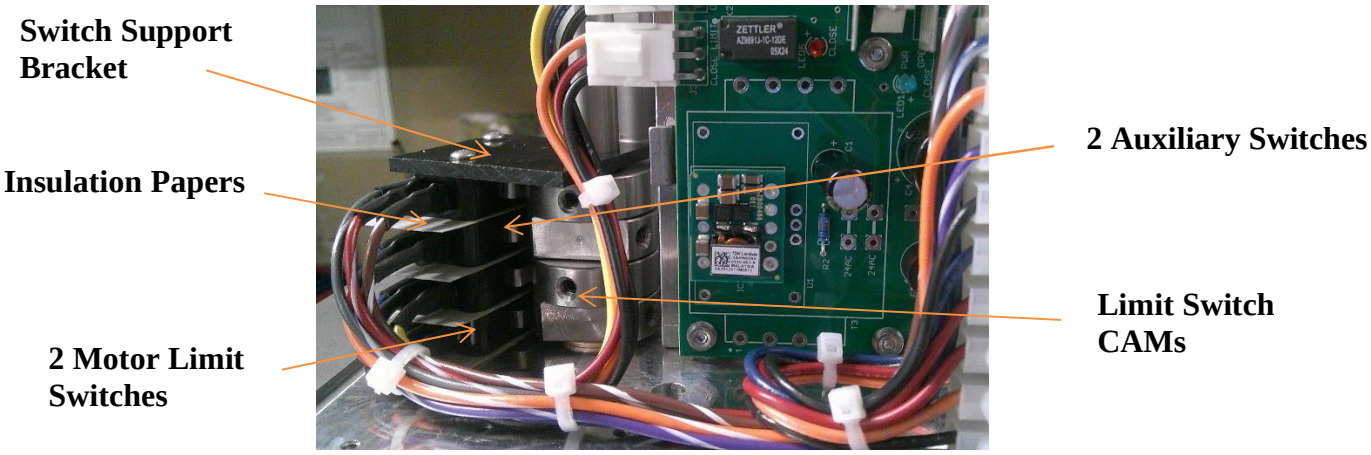
OPTIONAL AUXILIARY SWITCH OPERATION AND INSTALL:

The Optional Snap Action Auxiliary Switches are SPDT and the contacts are rated for:

10 Amps @ 250 VAC.

Auxiliary Switches are wired so that the switch "opens" when the actuator reaches the desired position and there is continuity between the Common and N.C. contacts of the switch. For example, when the actuator reaches the full OPEN position, the OPEN Auxiliary Switch will open and complete the circuit (continuity) between Common & N.C. This works the same for the CLOSE Auxiliary Switch in the CLOSE position. The CAMs for these switches can be adjusted to trigger a signal per the user requirements. Or, the Common and N.O. contacts can be used for the reverse effect.

Auxiliary switches (maximum 2 per actuator), can be set to any desired position throughout the travel of the actuator rotation. This is done by loosening the Auxiliary Switch CAM set screw and rotating the CAM to the desired position. When the position is set, re-tighten the CAM set screw.



SNS4-15 Series Actuator Auxiliary Switch Location

Most Auxiliary switches are ordered with the unit, but an Auxiliary Switch Kit (#90005-2S) can be ordered and installed in the field. Follow the appropriate wiring diagram for electrical connections of the switch wires.

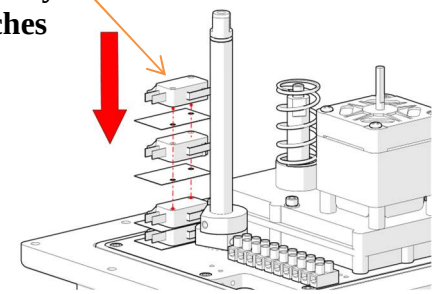
On the SNS4-15 Series Actuator, the Auxiliary Switches will mount directly on top of the motor limit switches. This kit will include 2 wired switches, longer screws, 2 additional CAMs with set screws, support bracket, insulation papers and a few wire ties.

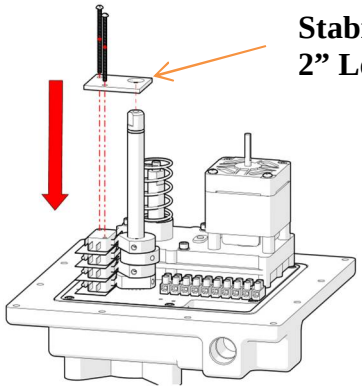
Auxiliary Switch Installation

1. Turn off the power supply to actuator.
2. Remove the screws/bolts securing the actuator cover and remove cover.
3. Remove the two (2) 4-40 x 1" long screws securing switches to base or bracket.
4. Stack auxiliary switch(es) on top of existing limit switches putting an insulating paper between each.
5. Install CAM(s) onto shaft, the order does not matter.
6. Install the black stabilizer bracket on to the shaft stacking it on top of the cams.

   B. Installing (2) auxiliary switches: Secure switches through the stabilizer bracket with 4-40 x 2" long screws.

Install Auxiliary Switches



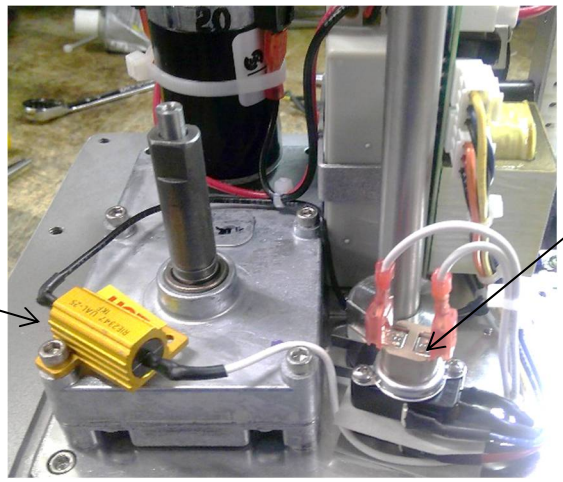


Stabilizer Bracket and 2" Long Screws

7. ICI standard actuators are shipped with a ten-position terminal strip and are wired for light indication; N.O. contact of the open switch is connected to terminal #4 and N.O. contact on close switch is connected to terminal #5. These two leads must be removed. ***(MODULATING ACTUATORS ARE NOT WIRED FOR LIGHT INDICATION, SKIP TO STEP 12)***
8. Loosen terminal connection #4 and pull the yellow wire out of terminal strip. Using wire cutters, cut this yellow wire off back at the limit switch and discard the yellow wire.
9. Loosen terminal connection #5 and pull the orange wire out of terminal strip. Using wire cutters, cut this orange wire off back at the limit switch and discard the orange wire.
10. If there is a Green Ground wire in one of the terminals 4-10, remove this completely.
11. **SWITCH 1:** Connect the common **(C)** wire **(**VIO/WHT**)**, the normally open **(N.O.)** wire **(**ORG/WHT**)**, and the normally closed **(N.C.)** wire **(**BLU/WHT**)** to the internal side of the white terminal block. Use the most appropriate terminal connection per the wiring diagram for your actuator shown on the next page.
12. **SWITCH 2:** If a second auxiliary switch is being installed, connect the common **(C)** wire **(**GRY/WHT**)**, the normally open **(N.O.)** wire **(**RED/WHT**)** and the normally closed **(N.C.)** wire **(**BRN/WHT**)** to the internal side of the white terminal block. Use the most appropriate terminal connection per the wiring diagram for your actuator shown on the next page.
13. Verify that all wires are secured and out of the way of switch levers, cams, and other moving parts. Do not interfere with the gasket or cover alignment and be sure wires will not be crushed when cover is re-installed.

OPTIONAL HEATERS AND CONDENSATION:

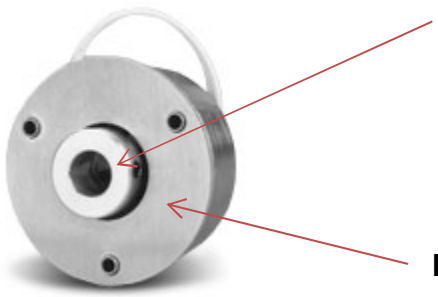
The SNS4-15 Series Actuator has the Option to have an internal Heater installed when manufactured or later in the field. The Heater Kits, come with 2 wires that connect into the SNS4-15 PC Board HEATER Connector (AC UNITS ONLY) or the White Terminal Block power input for DC Units – polarity DOES NOT matter. The wires are installed into the Terminal Block, one wire into each terminal, and the screws securely tightened. The Heater adds about 20W to the overall power consumption of the Actuator.



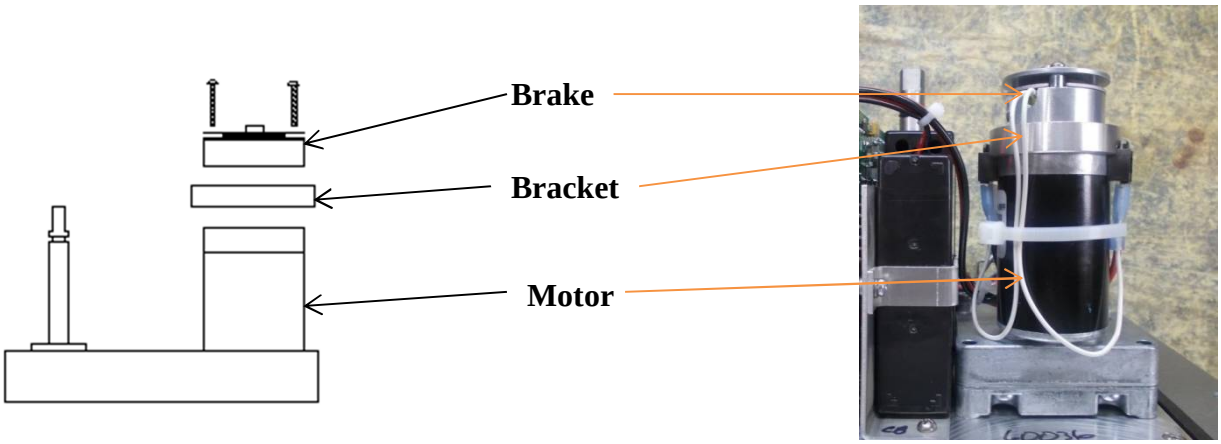
It is recommended that a Heater, be installed in applications where the Actuator is subject to Cold Weather and/or Humid Conditions. The Heater, along with a Thermostat **(#26002**), will maintain adequate temperature inside the enclosure for the components in Cold applications. It will also maintain a constant temperature to eliminate Condensation in Humid Environments. **The Heater is NOT ON when the SNS4-15 is running on Battery Power – ONLY when running on Mains Power!**

OPTIONAL MECHANICAL BRAKE:

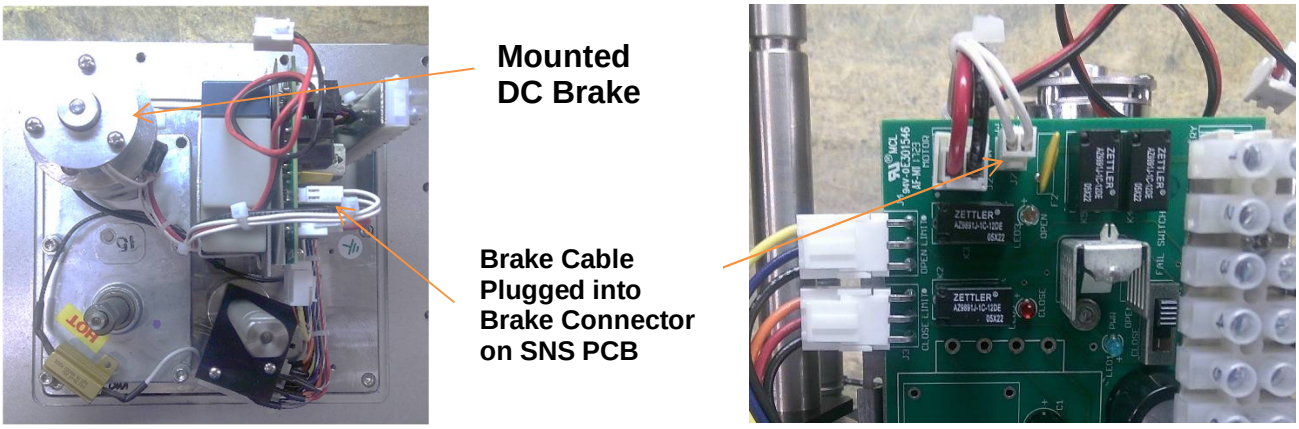
The SNS4-15 Actuators have the option to be fitted with a 12vdc Spring Applied Power OFF Brake. These can be ordered installed on the actuator, or added to the actuator in the field.



This brake will Open up to allow the motor shaft to spin freely when the DC power is applied to the motor. When the DC motor power turns OFF, the brake will LOCK the motor shaft in place and keep it from moving and thereby keep the Valve from back driving the Actuator. This is especially helpful in Butterfly Valve & Damper Applications.



A 12vdc Power Off Brake can be installed in the field when purchasing the SNS4-15 Brake Kit from Indelac. The brake will mount to the top of the actuator motor using the provided screws and bracket. The brake wiring connector will plug directly into the SNS4-15 Brake Header on the Standard board or the connector gets cut off and wired into the DC Modulating Controller Board motor terminals on the Modulating unit. There is no polarity to the brake wires, so the positive (+) and negative (-) does not matter. Refer to the above board photos for connector locations and the wiring diagrams for electrical connections.



HUB INSTALLATION: When the brake is mounted to the motor, slide the brake hub over the motor shaft being certain the square of the hub mates inside the friction disk of the brake. With the brake de-energized, bottom out the hub on the armature plate of the brake and pull the hub back out 0.010”-0.025” up from the plate and tighten the hub set screw to 5 in/lbs. torque. The brake hub should not make contact with the bottom of the brake armature plate.

NEMA 7 ENCLOSURE, GENERAL:

In general, operation and maintenance of a NEMA 7 electric actuator is no different than that of a NEMA 4 electric actuator. However, there are some precautions that must be followed.

1. **DO NOT** install in ambient temperatures that exceed 140° F. Mount, Test and Calibrate the actuator on a valve in a non-hazardous location.
2. **DO NOT** under any circumstances remove the actuator cover while in a hazardous location when the contacts are still live; this could cause ignition of hazardous atmospheres. After de-energizing the NEMA 7 actuator, wait at least 45 minutes before removing the cover to allow the heater to cool.
3. **DO NOT** under any circumstances use a NEMA 7 electric actuator in a hazardous location that does not meet the specifications for which the actuator was designed. The actuator 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 actuator. This will negate the NEMA 7 rating of the enclosure.
5. When replacing the cover on actuators rated NEMA 4 and 7 take care that the gasket is in place to assure the proper clearance after the cover is secured. After securing the cover screws to the proper torque (see Chart – 132 in/lbs.), check that the clearance between the cover and the base is 0.00" – no gaps!
6. All electrical connections must be to state and local codes and in accordance with the specifications for which the unit is being used.

NOTE: *After proper installation, the actuator will require little or no maintenance. In the event maintenance is required remove it from the hazardous location before attempting to work on it. If the actuator is in a critical application and down time is not permitted it is advisable to have a* ***spare actuator in stock****.*

DUTY CYCLE:

All SNS Series actuators are rated 100% duty cycle at 100% ambient temperature at rated torque.

MANUAL REVISIONS

MAY 13, 2020	ADDED ELECTRICAL SPECIFICATIONS FOR AUXILARY SWITCHES / CONTACT CURRENT; UPDATE INDELAC LOGO.
AUG 27, 2025	COMPLETE MANUAL UPDATE: NEW PCB PHOTOS AND REVISED WIRING DIAGRAMS, ADDED EXTENDED SECTIONS FOR BRAKES, HEATERS & AUXILIARY SWITCHES, NEW SPARE PARTS, LIGHT INDICATION AND BATTERY MAINTENANCE SECTIONS.

If you require Technical Assistance on any of our actuator or control products, please contact your local distributor.

Indelac Controls, Inc.
6810 Powerline Drive
Florence, KY 41042
+1 (859) 727-7890

TESTING AND TROUBLESHOOTING:

Battery Condition Test

1) Remove the external power and verify that the Green LED illuminates. If it does, then the battery is properly charged and ready for operation.
2) If the Red LED illuminates, the battery is low.
3) Apply external power to the actuator and verify that the Blue LED illuminates.
4) Wait 8 hours and repeat by removing the external power.
5) If the Green LED illuminates, the battery is good and is charged.
6) If the Red LED illuminates, or is OFF, the battery is bad and needs to be replaced.

Power Test ****DO NOT CHANGE ANY SWITCH SETTINGS WITH THE POWER ON****

1) Apply external power to the actuator. The Blue LED should illuminate.
2) If there is no Blue LED, check that the incoming power is terminated & the breaker is on.
3) Next, verify that the power is correctly connected to the actuator and the wires are tight in the input connector.
4) On AC versions, make sure that the 115/230V switch is in the proper position for the appropriate power input.
5) On the DC versions, verify that either the 24V or 12V is connected to the appropriate terminal.
6) If still no Blue LED, check the on board fuse (AC & modulating versions only) in the Safe & Secure Actuator.
7) If the fuse is blown, replace the fuse.
8) If the fuse is good, the circuit board is bad and needs to be replaced.
9) On modulating versions, a control input signal needs to be present to run the actuator.

DC Modulating Board LED Fault Conditions

The Green and Red LEDs on the DC Modulating Board will give the user Fault Status under certain conditions. See the chart below:

Green	Red	Condition
-	Flash	Limit Switch 1 disconnected
Flash	-	Limit Switch 2 disconnected
Blink	OFF	Feedback Pot too Low (<0.25V)
OFF	Blink	Feedback Pot too High (>4.75V)
Blink	Blink	Low Input Voltage (<10V)
ON	ON	Input Voltage Too High (>30V)

***Flash = very fast; Blink = longer, slow*

If one of the Limit Switches is **disconnected**, check the jumper wiring to terminals #6-8 and #6-7 on the Modulating board – make sure the wires and terminal screws are tight. (See Modulating Wiring Diagram)

If the Feedback Pot is too **Low** or too **High**, the Actuator is Out of Calibration and the unit needs to be re-calibrated per the above DC Modulating Calibration Steps.

If the Main DC Power to the DC Modulating board drops **below 10vdc** or goes **above 30vdc**, the Fault Condition will be indicated and the Input Power needs to be corrected. Check the voltage from the ProVolt Board to the DC Modulating Board.

TESTING AND TROUBLESHOOTING:

SYMPTOM	PROBLEM	SOLUTION
Actuator does not respond to Command Signal	Power not on	Turn ON Power
	Actuator wired incorrectly	Check wiring diagram & re-wire
	Wrong voltage	Check power supply & make appropriate changes
	Motor Fuse Tripped	Allow time for motor to cool down; reset fuse
	Actuator and valve in opposite positions when actuator was mounted	Remove actuator , rotate 90 degrees & re-mount
	Input Power fuse blown	Replace with proper value fuse
	Input signal wires not tight in terminals	Tighten terminal block screws
	Bad Brake – Locked Up	Remove brake hub & try to run without brake. If unit runs, replace the brake.
	Modulating Unit out of Calibration	Follow the Modulating Actuator re-calibration steps
	DC Modulating Board not set up Properly	Check DC Modulating Board DIP Switch Settings for proper Command Signal Input – reset switches
Actuator will not OPEN or CLOSE completely	Travel limits set incorrectly	Reset CAMs and /or adjust the SPAN and ZERO pots on the DC Controller Board
	Valve Torque is too high for actuator	Install correct size actuator
	Modulating Unit out of Calibration	Follow the Modulating Actuator re-calibration steps
	Mechanical Stops limiting travel	Remove the stops: CAUTION – Do not remove any part required for the proper operation of the actuator
Valve Oscillates	Valve torque is too high for actuator	Install correct size actuator
	Actuator installed on butterfly valve	Install a motor brake
	Motor brake not locking motor at end of travel	Check brake wiring for proper connection or replace brake
	Set screw in brake hub is loose	Reset brake hub and tighten down set screw
	Modulating Unit Deadband is set too tight	Adjust DC Modulating Board Deadband Pot to loosen up deadband setting
Motor Runs, but Output Shaft does not rotate	Internal gears damaged or broken gear key	Contact Indelac Controls or nearest distributor
Modulating Unit does not complete full travel but board LEDs are still ON	Modulating Unit is out of Calibration	Follow the Modulating Actuator re-calibration steps
	Feedback potentiometer or it's gear has come loose	Tighten down the pot gear and re-calibrate the unit

NOTES

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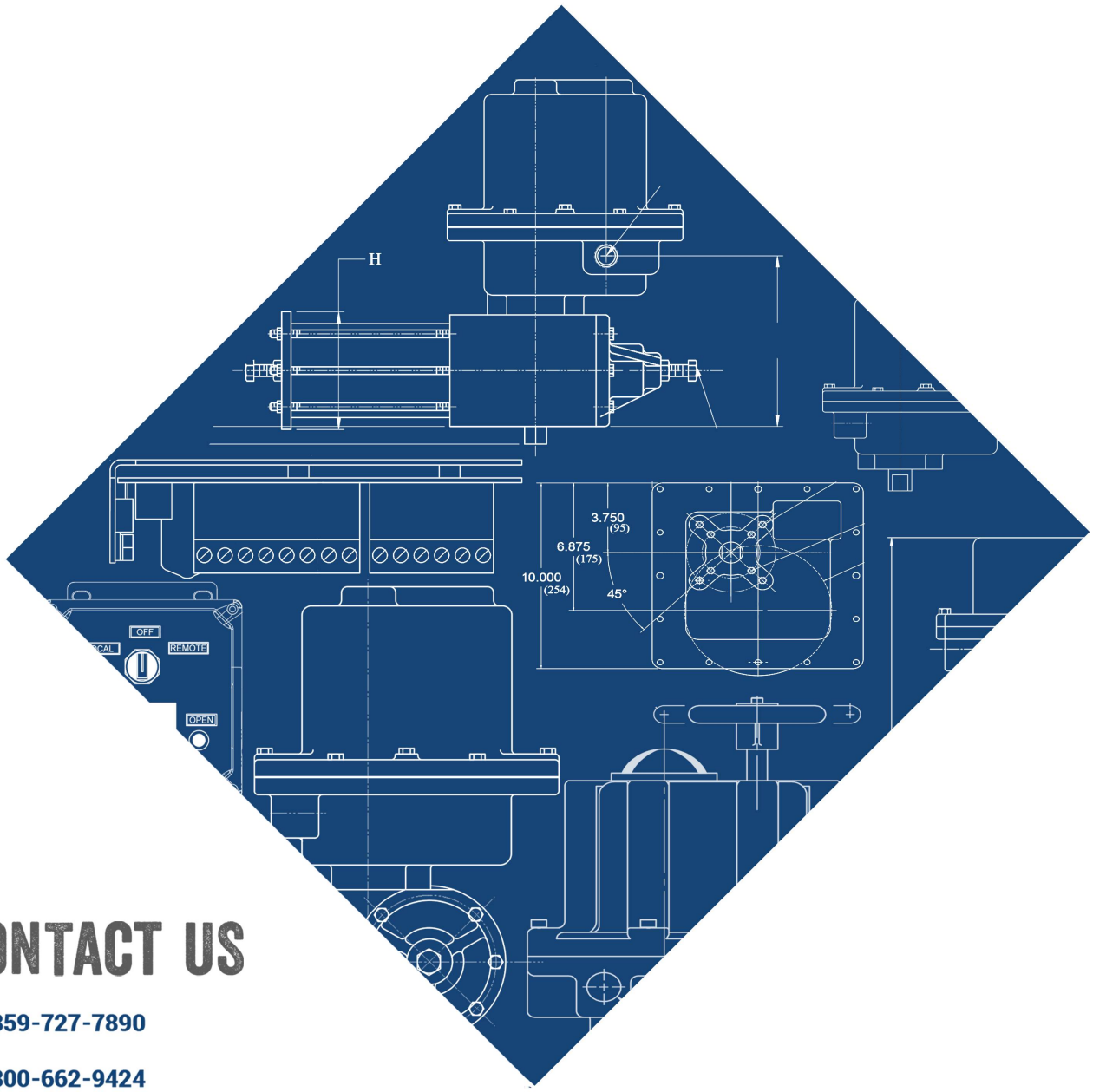
CONTROLS, INC.



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