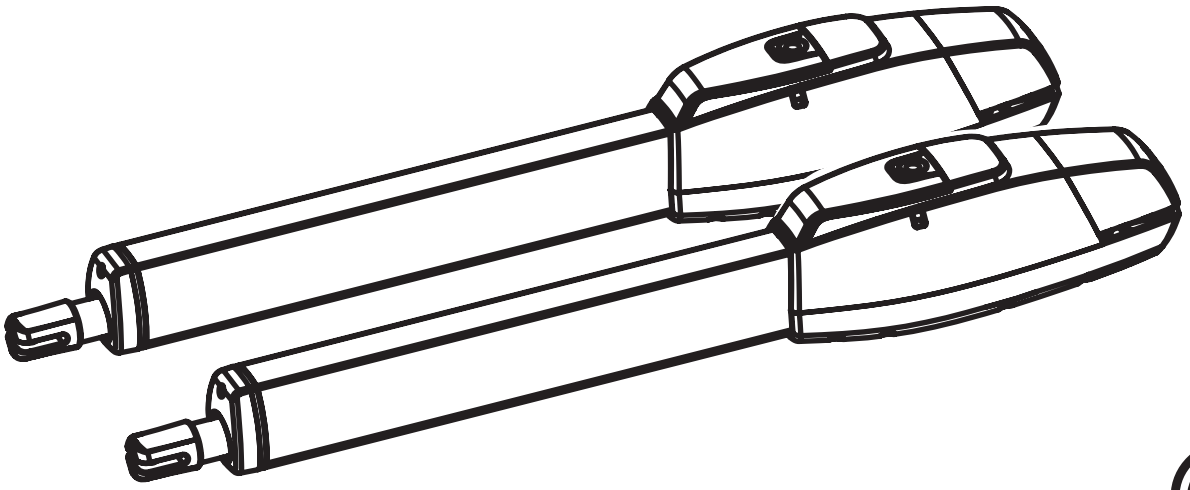
TORO 24



SWING GATE OPENER

INSTALLATION MANUAL

ETL LISTED US
Compliant
UL325
Compliant
UL991
Compliant
Canada
CSA C22.2
Compliant

WWW.ALLOMATIC.NET

Reuse
Reduce
Recycle

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PARTS BREAKDOWN . . . . . Check Website

IMPORTANT SAFETY INSTRUCTIONS

WARNING

TO REDUCE THE RISK OF INJURY:

READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS. DO NOT START INSTALLATION UNTIL YOU HAVE READ AND UNDERSTAND THESE DIRECTIONS. IF THERE IS SOMETHING YOU DO NOT UNDERSTAND, PLEASE CALL US.

NEVER let children operate or play with gate controls.

Locate the control station and make sure it is (a) within sight of the gate and (b) at a minimum height of 5 feet so small children cannot reach it.

Install the enclosed entrapment warning signs next to the control station and in a prominent location.

For operators equipped with a manual release, instruct the end user on the correct operation of the manual release. Use the manual release only when the gate is not moving. It is advised that the power be turned off.

Always keep people and objects away from the gate. No one should cross the path of a moving gate.

The gate operator must be tested monthly. The gate must reverse on contact with a rigid object, or stop when an object activates the non-contact sensor(s). Always re-test the operator after adjusting the limits and/or force. Failure to adjust and re-test the gate operator properly may cause sever injury or death.

Keep gate(s) properly maintained. Have a qualified service technician make repairs to gate hardware and make proper adjustments to gate operator.

This gate entrance/exit is for vehicles only. Pedestrians must use a separate entrance.

There is nothing on a gate operator that is easily repaired or adjusted without a great deal of experience. Call a qualified gate service technician who knows your gate operator.

SAVE THESE INSTRUCTIONS

INSTALL THE GATE OPERATOR ONLY WHEN YOU HAVE READ THE FOLLOWING

BEFORE GATE OPERATOR INSTALLATION

- Confirm that the gate operator being installed is appropriate for the application.
- Confirm that the gate is designed and built according to the current published industry standards.
- Confirm that all appropriate safety features and safety accessory devices are being installed, including all entrapment protection devices.
- Make sure that the gate opens and closes freely (by hand) before installing the operator.
- Repair or replace worn or damaged gate hardware before installing the gate operator.
- Eliminate all gaps in the sliding gate below a 6 foot height that permits a 2 1/4” sphere to pass through any location. This includes the area of the adjacent fence covered when the gate is in the open position
- Eliminate all gaps in a swing gate below a 4 foot height that permits a 4” sphere to pass through any location. This includes the hinge area of the gate.

GATE OPERATOR INSTALLATION

- Operator must be disconnected from the power source before attempting any installation of accessories.
- Install gate operator according to the installation instructions in this manual.
- Adjust the operator clutch or load sensing device to the minimum force setting that will allow for reliable gate operation.
- Install the operator inside the fence line. Do not install the operator on the public side of the fence line.
- Install a proper electrical ground to the gate operator.
- Controls intended for user activation must be located at least 6 feet away from any moving part of the gate, and where the user is prevented from reaching over, under, around, or through the gate to operate the controls.
- Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.
- The stop and/or reset button must be located in the line of sight of the gate. Activation of the operator reset control shall not cause the operator to move.
- Install a minimum of 2 warning signs, one on each side of the gate where they are easily visible.
- Take pictures of the installation.
- Test all safety features for proper function before placing the automatic vehicular gate in operation.

MAINTENANCE

- Train owners/users on the basic functions and safety features of the gate system, including how to turn off the power and operate the manual disconnect feature.
- Leave safety instructions, product literature, installation manual, and maintenance manual with the owner or end user.
- Explain to the owner or end user the importance of routine service and operator testing on a monthly basis.

UL 325 CLASS TYPES AND OBSTRUCTIONS SENSING SYSTEMS

Each class must have (2) monitored entrapment protection devices in each entrapment zone to sense and react to obstructions within 2 seconds.

All-O-Matic's gate operators conform to the most rigid Class One.

UL 325 CLASS TYPES

CLASS ONE: RESIDENTIAL
- A vehicular gate operator intended for use in garages or parking areas associated with a residence of one to four single families.

CLASS TWO: COMMERCIAL OR GENERAL PUBLIC ACCESS
- A vehicular gate operator intended for use at a commercial location or building, such as a multi-family housing unit (five or more single family units), hotel, garages, retail stores, or other buildings accessible by or servicing the general public.

CLASS THREE: INDUSTRIAL OR LIMITED ACCESS
- A vehicular gate operator intended for use at an industrial location or building, such as a factory, loading dock area, or other locations not accessible by or intended to service the general public.

CLASS FOUR: RESTRICTED ACCESS
- A vehicular gate operator intended for use at a guarded industrial location or building, such as airport security areas or other restricted access locations not servicing the general public and where unauthorized access is prevented via supervision by security personnel.

THE SIX TYPES OF OBSTRUCTION SENSING SYSTEMS

TYPE A:
- Inherent entrapment protection system. This system must sense and initiate the reverse of the gate within 2 seconds of contact with a solid object.

TYPE B1:
- Non-contact sensor (photoelectric sensor or equivalent). This system shall, upon sensing an obstruction in the direction of the gate travel, reverse the gate within a maximum of 2 seconds.

TYPE B2:
- Contact sensor (edge device or equivalent). This system shall, upon sensing an obstruction in the direction of the gate travel, initiate the reversal of the gate within a maximum of 2 seconds.

TYPE C:
- Inherent force limiting, inherent adjustable clutch, or pressure relief valve.

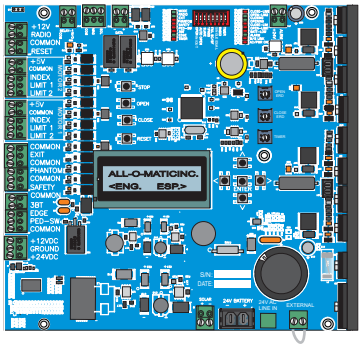
TYPE D:
- Actuating device requiring continuous pressure to maintain opening or closing motion of the gate.

OPERATOR SPECIFICATIONS

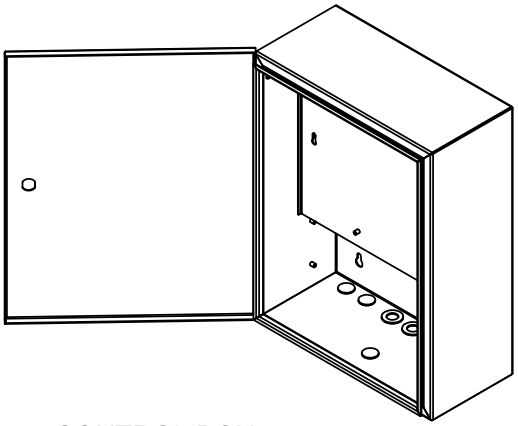
	TORO 24
Max Gate Weight	8’ wide gate - 1,600 lbs. 12’ wide gate - 1,200 lbs.
Max Gate Length	16’ wide gate - 800 lbs. 18’ wide gate - 600 lbs.
Warranty	4 year residential 3 year commercial
Motor	24 VDC Motor
Gate Speed	Adjustable 15-20 seconds per 90 degree opening
Power	115 VAC single phase - 4 amps 230 VAC single phase - 2 amps or 12/24 VDC solar panel up to 80 watts
Duty Cycle	Continuous
Temperature Range	-40º to 160º
Gear Box Ratio	N/A
Dimensions	Fully retracted arm: 38-39” Fully extended arm: 59”
Shipping Weight	Arm: 24 lbs. Control box: 55 lbs.
Emergency Release	Keyed manual release
Belt Size	N/A
Main Sprocket	N/A
Chain Size	N/A
Gear Box Sprocket	N/A
Limit Shaft Sprocket	N/A
Breaker Requirement	20 amp dedicated
Gearbox Pulley	N/A
Motor Pulley	N/A
UL Classes	I & II

PARTS IDENTIFICATION

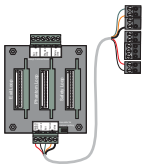
- The back mounting bracket must be cut to fit the arm geometry.
- Use the back mounting plate when a steel post is not available to weld the back mounting bracket on to.



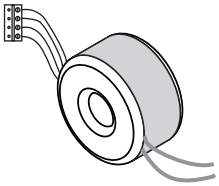
TORO CONTROL BOARD



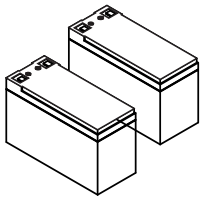
CONTROL BOX



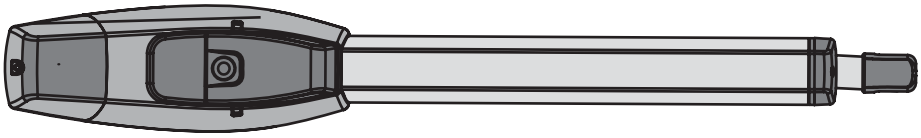
LPR-1
LOOP RACK



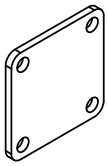
TRANSFORMER



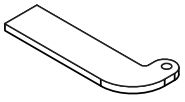
(2) 7AH BATTERY



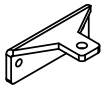
GATE OPERATOR



BACK MOUNTING
PLATE



BACK MOUNTING
BRACKET



FRONT GATE
BRACKET

(2) PIVOT
PINS

PIVOT PIN
SECURE
SETSCREW

(2) EMERGENCY
RELEASE KEY

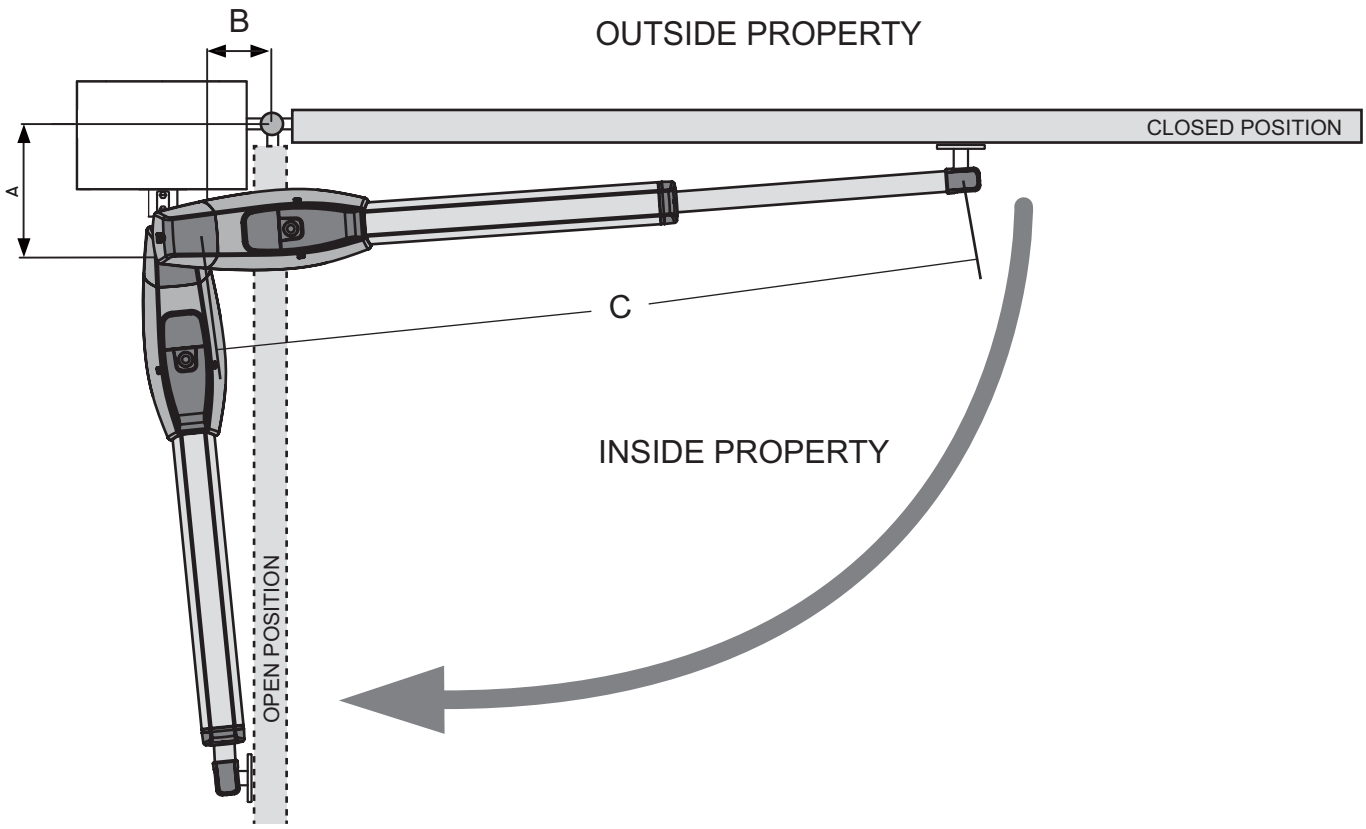
PULL TO OPEN INSTALLATION

For proper operation, use the installation measurements in the chart below.

If necessary, modify the gate construction for best automation performance.

Before proceeding with the gate operator installation, be sure of the following:

- The gate moves open and close freely when on manual.
- The gate hinges are properly positioned and lubricated.
- There are no obstructions in the path of the gate.
- There is no friction between the gate or ground when the gate is in motion.



GEOMETRY OPTIONS

OPTION	A	B	C	SPEED	
1	7”	5”	58”	15 SEC	90º OPENING
2	8”	6”	58”	17.5 SEC	90º OPENING
3	7.5”	7.5”	58”	19 SEC	90º OPENING

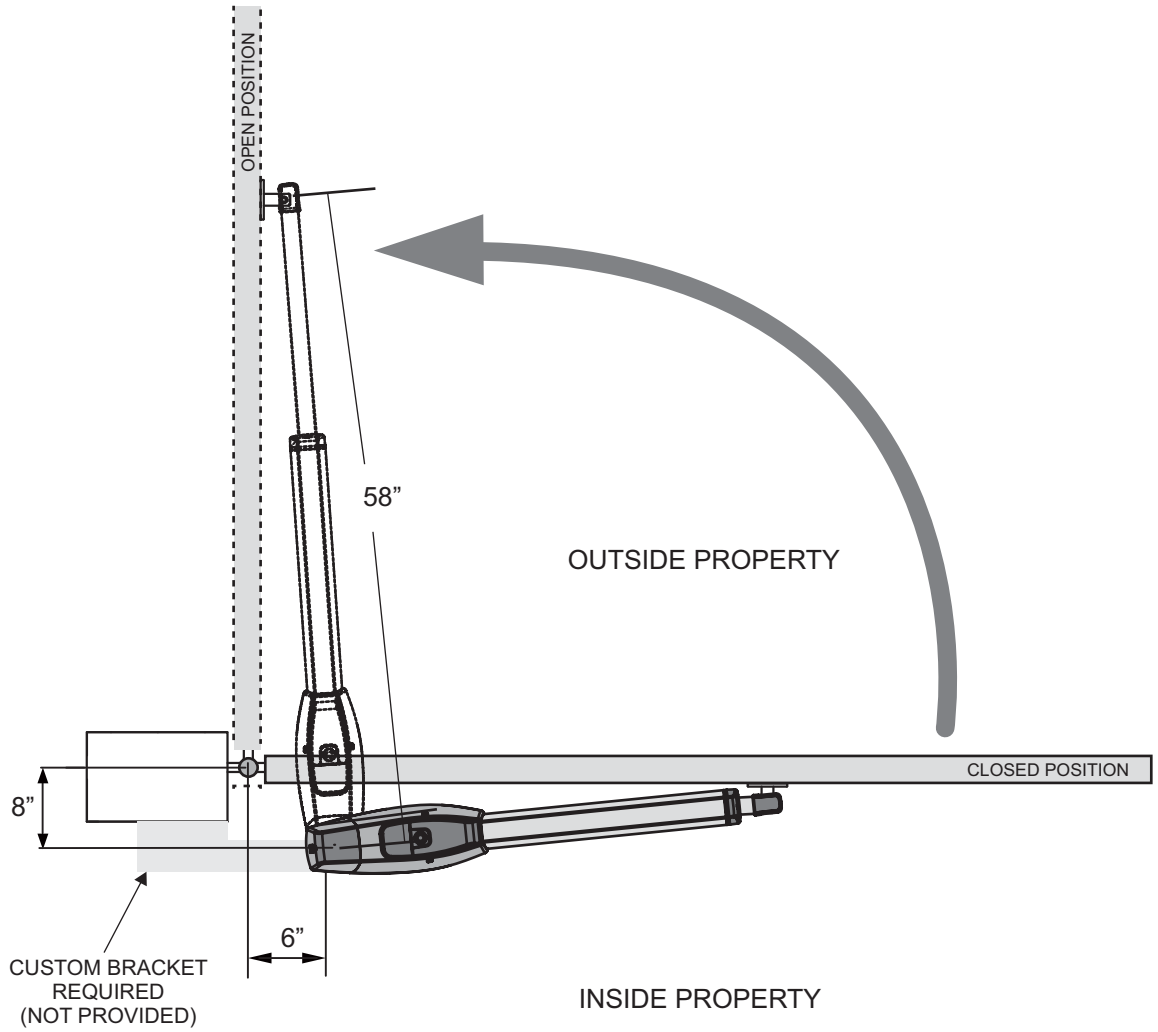
PUSH TO OPEN INSTALLATION

For proper operation, use the installation measurements in the drawing below. A custom bracket is required for this type of installation.

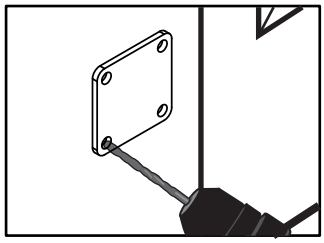
If necessary, modify the gate construction for best automation performance.

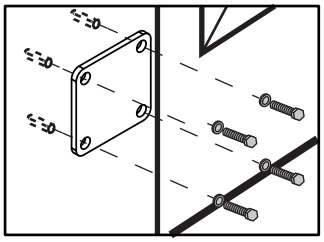
Before proceeding with the gate operator installation, be sure of the following:

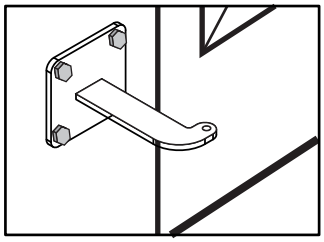
- The gate moves open and close freely when on manual.
- The gate hinges are properly positioned and lubricated.
- There are no obstructions in the path of the gate.
- There is no friction between the gate or ground when the gate is in motion.



OPERATOR INSTALLATION



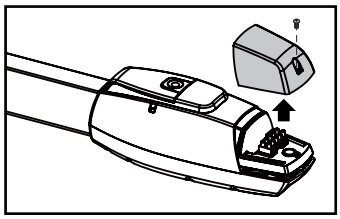


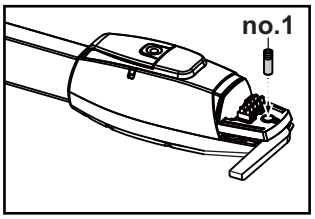


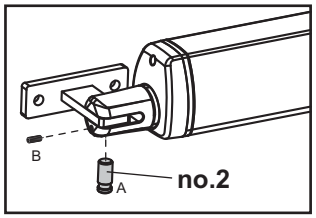
Use the back mounting plate to have a welding surface when a steel post is not available. Use anchor bolts to mount the plate to existing surface.

Cut the back mounting bracket to fit the geometry and weld the bracket to the steel post or back mounting plate.

NOTE: A custom mounting plate is required for gates that open to the outside. See “Push to Open” installation page.







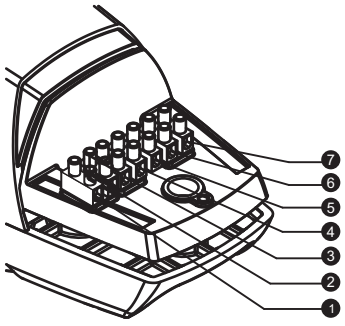
Remove the wire connection cover on the arm and attach the back mounting bracket with the pin.

Release the gate operator and place the pin into the fitting position no.1 and no.2, as shown below. Use the setscrew to hold pin no.2 in place.

Make sure that the gate operator is mounted in a horizontal position.

Prior to welding the front gate bracket to the gate leaf, make sure to cover the gate operator to prevent any damage from welding sparks.

WIRE CONNECTION:

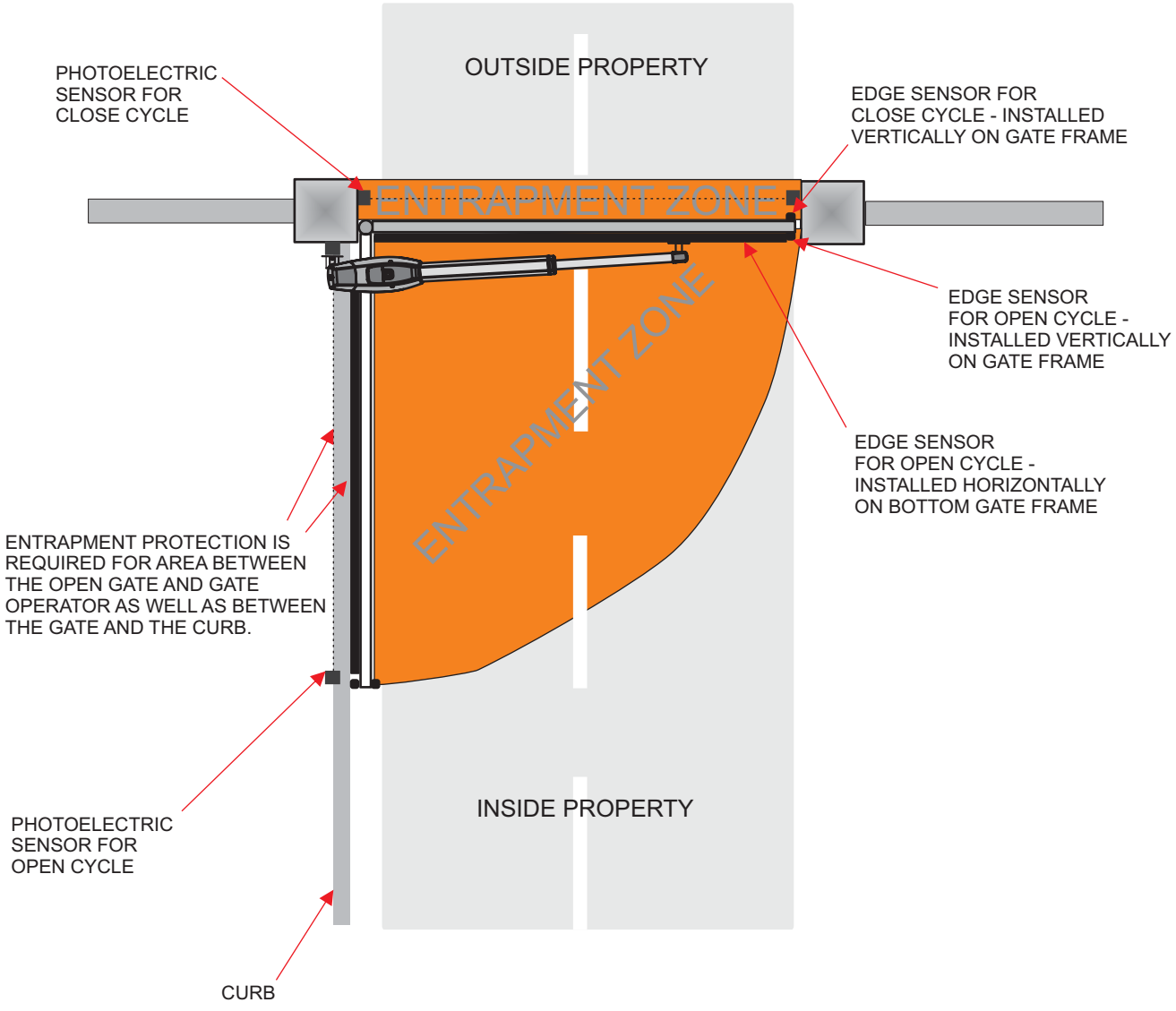


❶	**Yellow**	Motor (+)
❷	**White**	Motor (-)
❸	Red	+5V
❹	White	INDEX
❺	Black	COMMON
❻	Blue	Limit Switch (Limit 1)
❼	Green	Limit Switch (Limit 2)

(1) Avoid tension in the cable during open and close cycles.
(2) Always connect the grounding wire (GND)

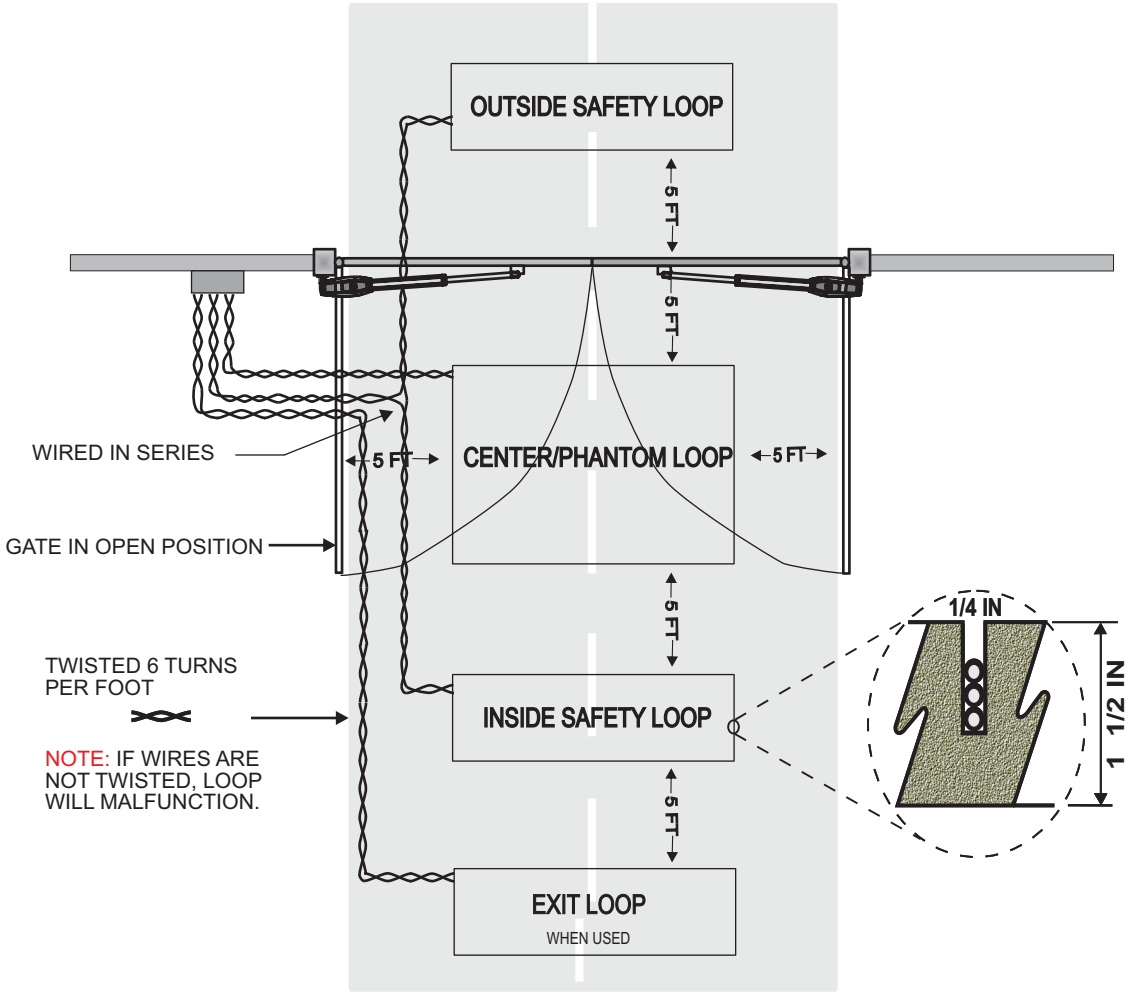
ENTRAPMENT PROTECTION INSTALLATION

- A minimum of (2) monitored entrapment protection devices are **REQUIRED** for each entrapment zone.
- An entrapment zone is a location or point of contact where a person can become entrapped between a moving gate and a rigid object.
- The operator is equipped with an inherent entrapment protection system (ERD).
- The gate operator requires an external monitored entrapment protection device (non-contact photoelectric sensor or contact edge) for each entrapment zone prior to gate operation. The operator cycles power to the external entrapment protection device and checks for device signals. If the operator does not receive the correct feedback from the device, the gate will not operate.



LOOP LAYOUT

- Below is a typical loop layout. When connecting to an All-O-Matic circuit board, use the following:
  - Safety Loop - Normally Closed (N.C) Contacts
  - Center/Phantom Loop - Normally Open (N.O.) Contacts
  - Exit Loop - Normally Open (N.O.) Contacts
- Wires **MUST** be twisted from the exit point of the loop saw cut to the gate operator.
- Twist loop wires 6 turns per foot, as shown below. Improper twisting of wires can cause loop issues.
- When using an inside and outside safety loop, loops must be **WIRED IN SERIES**.



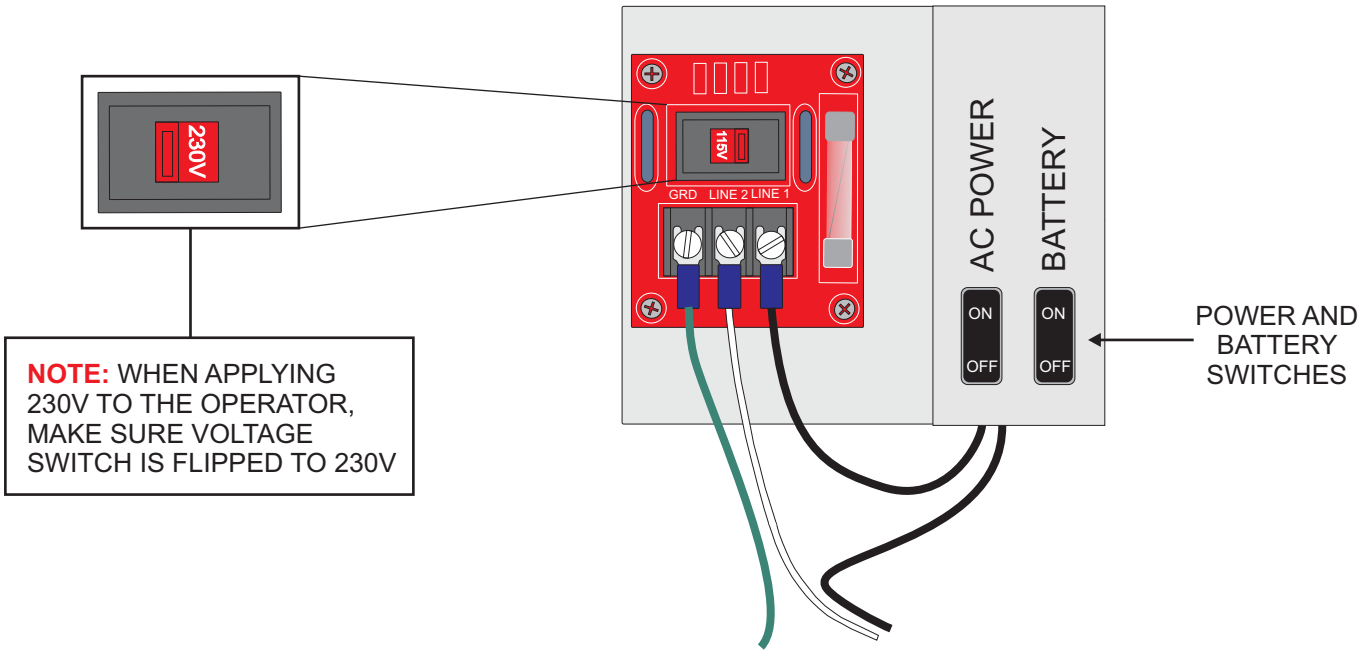
ELECTRICAL CONNECTION

OPERATORS **MUST** BE PROPERLY GROUNDED!

- All gate operators **MUST** be properly grounded. This minimizes or prevents damage due to electrical charge, such as a near lightening strike or an electrical static discharge.
- Use a single wire for the ground. **DO NOT** splice two wires for the ground. If the wire breaks or is cut, replace it with a single length wire. **NEVER** use two wires for the ground.
- Check the local city code for proper earth ground rod type and grounding procedures.

- Use a minimum of a **20-amp**, dedicated circuit for power.

Power Connection	115 VAC	230 VAC Single Phase
LINE 1	115V HOT	230V LINE 1
LINE 2	115V NEUTRAL	230V LINE 2
GND	GROUND	GROUND



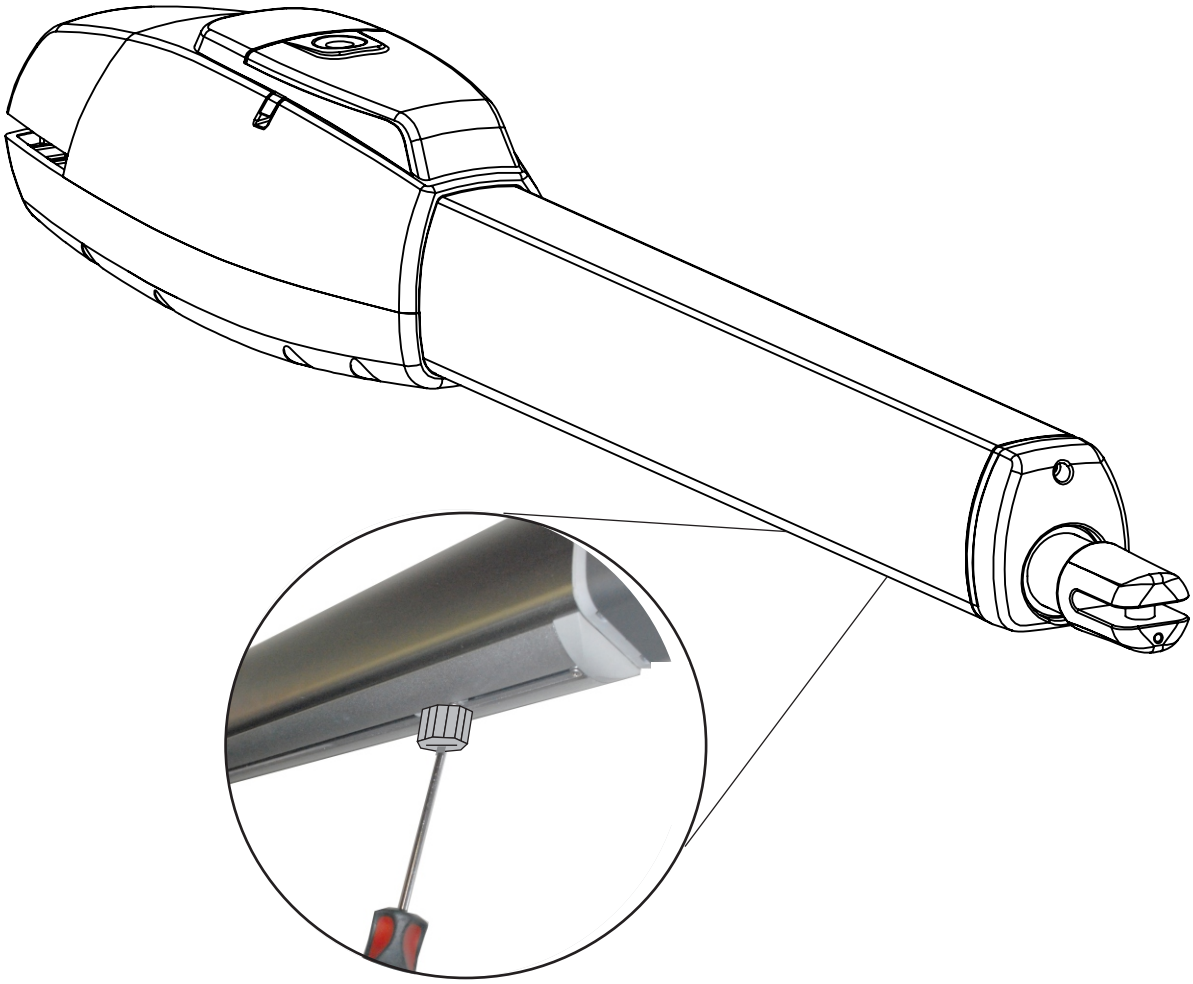
GATE TRAVEL ADJUSTMENT

Step 1: Find the open and close limit switches on the bottom of the gate actuator.

Step 2: Loosen the limit switch screws to allow the switch to slide.

Step 3: Make the necessary adjustments to the limit switch.

Step 4: Tighten the screws to lock limit switch in place.



SETTING AND DIAGNOSTIC MENU DESCRIPTIONS

<ENG Press the left arrow button (<) to select English
ESP> Press the right arrow button (>) to select Spanish

SETTINGS MENU

- TIME & DATE
  Set and/or edit the time and date.
- SPEED
  MAX SPEED: Set the maximum operational speed of the motor.
  ACCELERATION: Set how fast the gate will accelerate at motor start. This can be set at slow, medium, or fast.
  SLOW DOWN: Set the travel percentage where the motor will start slowing down as it approaches the open and close limit.
- POWER
  TORQUE: Set the torque level to low, medium, or high.
  CURR. SENSE: Set the way the board reads current from load. **THLD** (threshold) is the default setting and is recommended for normal operation.
  PRGV (progressive) is used in installations where wind is a factor for the gate.
- 7 DAY TIMER
  EVENT 1: Set up to 10 programmable events.
  EVENT ACT.: Set the event actions
  OFF (Disabled) = Nothing happens
  OPEN = Opens the gate once
  OPEN & HOLD = Opens the gate and holds it open. Only a close event or close override command will close the gate
  CLOSE = Closes the gate once
  CLOSE & HOLD = Closes the gate and holds it closed. Only an open event or open override command will open the gate
  AUX RELAY ON = Turns auxiliary relay on
  AUX RELAY OFF = Turns auxiliary relay off
  TIME: Set the time the action takes place.
  DAYS (ACTIVE): Set the days the action is to be active. Each day need to be manually turned on using the right arrow (>) to toggle it on/off.
- LEAF DELAY
  DELAY LEAF: Select the leaf to have the delay. This function is used in dual gate applications only. Leaf delay is for the open cycle of the selected leaf. The close delay will be on the opposite leaf of the one that is selected.
  DELAY: Set the delay for the selected leaf.
- AUXILIARY RELAY
  RELAY ACTION: Set the action of the relay function.
  OFF: Relay is inactive
  PRE-WARN SIGNAL: Relay is used to turn on a strobe light or siren with a delay before the gate starts moving. Adjustable up to 6 seconds.
  MOVING SIGNAL: Relay is on and kept active while the gate is in motion.
  ALARM SIGNAL: Relay is on when the gate has been tampered with. This is used as an alarm sensor output.
  OPENED SIGNAL: Relay is on and kept active when the gate is in the fully open position.
  CLOSED SIGNAL: Relay is on and kept active when the gate is in the fully closed position.
-

SERVICE CYCLE
  SERVICE CYCLE COUNT: Used to program a service call. Set the number of cycles you want the gate to run before the gate operator gives off an audible double beep alarm. The alarm will off every hour for 1 minute to let the customer know that the gate needs service.
- LIMIT SW CONF.
  INDEX: This is the default configuration. The limit uses a hall effect sensor for speed control and to keep track of the gate position.
  BEMF: This option is used when the gate is to run only on limit switches. NOTE: Not fully functional.
- SET TO DEFAULT
  DEFAULT ALL: Resets all parameters (below) to factory settings.
  DEFAULT SPEED: Resets speed to 100%, acceleration to fast, and the slow down to 90%.
  DEFAULT POWER: Resets torque to medium and the current sense to progressive.
  DEFAULT 7/D TIMER: Disables all events and makes them inactive.
  DEFAULT LEAF DLY: Resets leaf selection to none and 0.0 seconds.
  DEFAULT RLY FUNC: Resets relay function to off/inactive.
  DEFAULT SVC C: Resets service counter to 00000.
  DEFAULT SW CONF.: Resets limit switch configuration to index.

DIAGNOSTICS MENU

- GATE STATUS: Provides status of gate (ie: opening, opened, closing, closed, stopped, or stopped ERD)
- METER: Provides status of battery voltage, line in voltage, motor 1 current draw, and motor 2 current draw.
- MOTOR ONE: Provides speed and position of gate travel of motor 1.
- MOTOR TWO: Provides speed and position of gate travel of motor 2.
- EVENT LOG: Provides the last 25 abnormal gate events to assist in troubleshooting. The events are date and time stamped as they happen.
- CYCLE COUNT: Provides life, month, day, and remaining service cycle counts.

SETTINGS MENU PROGRAMMING AND DIAGNOSTICS

SETTINGS MENU PROGRAMMING

ENTERING THE SETTINGS MENU
- Press the ENTER button twice to turn the LCD display on
- Press the left arrow (<) button to select English
- Use the arrows to select SETTINGS and press ENTER
- Use the up/down arrows to scroll through the menu list
- Press ENTER to make your selection
- Use the left arrow (<) to go back to the previous screen

SETTING THE TIME AND DATE
- From the SETTINGS menu, select TIME & DATE and press ENTER
- Move the cursor to TIME and press ENTER
- Use the right and left arrows to move between hours and minutes
- Use the up and down arrows to change the time
- Press ENTER to save the time
- Move the cursor to DATE and press ENTER
- Use the right and left arrows to move between the month, day, and year.
- Use the up and down arrows to change the date
- Press ENTER to save the date
- Use the up and down arrows to scroll through the days of the week
- Press ENTER to save the day

SETTING MOTOR SPEED
- From the SETTINGS menu, select SPEED and press ENTER
- Use the up and down arrows to scroll through the sub menu and press ENTER to edit desired setting
- The MAX SPEED can be adjusted between 50-100%. Use the up and down arrows to change the percentage and press ENTER to save
- The ACCELERATION can be set at slow, medium, and fast. Use the up and down arrows to change the setting and press ENTER to save
- The SLOW/DOWN can be adjusted between 70-95%. Use the up and down arrows to change the percentage and press ENTER to save

SETTING MOTOR POWER
- From the SETTINGS menu, select POWER and press ENTER
- Use the up and down arrows to scroll through the sub menu and press ENTER to edit the desired setting
- The TORQUE can be set at low, medium, or high. Use the up and down buttons to change the setting and press ENTER to save
- The CURR. SENSE can be set at threshold (THLD) for normal operation or progressive (PRGV) for windy areas. Use the up and down arrows to make selection and press ENTER to save

SETTING THE 7 DAY TIMER
- From the SETTINGS menu, select 7/DAY TIMER and press ENTER
- Select the EVENT you would like to program and press ENTER
- Use the arrows to select the ACTION and press ENTER to save
- Use the arrows to set the time for the action and press ENTER to save
- Set the days you would like the action to take effect. Use the up and down arrows to scroll through the days and the right arrow to toggle the day on/off
- Repeat the steps above for each event (up to 10)

SETTING THE LEAF DELAY
- From the SETTINGS menu, select LEAF DELAY and press ENTER
- Press ENTER to select which leaf needs the delay. The cursor will blink on the left side of DELAY LEAF
- Use the up and down arrows to toggle between ONE/TWO leaves and press ENTER to save
- Select DELAY and press ENTER. Use the up and down arrows to set the delay between 0.00 and 6.0 seconds.

SETTING THE AUXILIARY RELAY
- From the SETTINGS menu, select AUXILIARY RELAY and press ENTER
- Use the up and down arrows to select the function and press ENTER
- If PRE-WARN SIGNAL was selected, you must set the delay. use the up and down arrows to set the pre-warn delay and press ENTER to save.
- NOTE: An asterisk (*) will appear on the selected function

SETTING THE SERVICE CYCLE
- From the SETTINGS menu, select SERVICE CYCLE and press ENTER
- Press ENTER to set the number of cycles
- Use the right and left arrows to move the cursor and the up and down arrows to change the number. Press ENTER to save

SETTING THE LIMIT SWITCH CONFIGURATION
- From the SETTINGS menu, select LIMIT SW CONF. and press ENTER
- Press ENTER to edit the setting. Use the up and down arrows to toggle between INDEX and BEMF and press ENTER to save

RESETTING BACK TO DEFAULT
- From the SETTINGS menu, select SET TO DEFAULT and press ENTER
- Use the up and down arrows to select the parameter you would like to set back to factory default and press ENTER
- DEFAULT all will set every parameter back to factory settings.

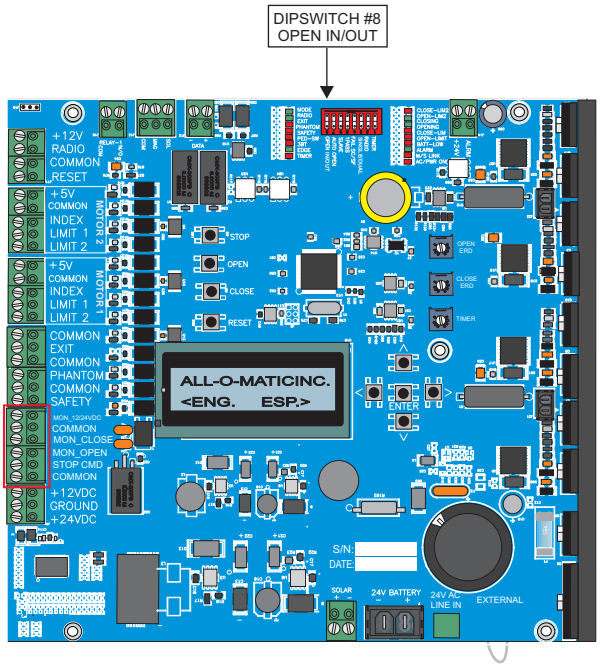
DIAGNOSTICS MENU

ENTERING THE DIAGNOSTICS MENU
- Press the ENTER button twice to turn the LCD display on
- Press the left arrow (<) button to select English
- Use the arrows to select DIAGNOSTICS and press ENTER
- Use the up/down arrows to scroll through the menu list
- Press ENTER to make your selection
- Use the up and down arrows to scroll through the sub menus and gather data
- Use the left arrow (<) to go back to the previous screen

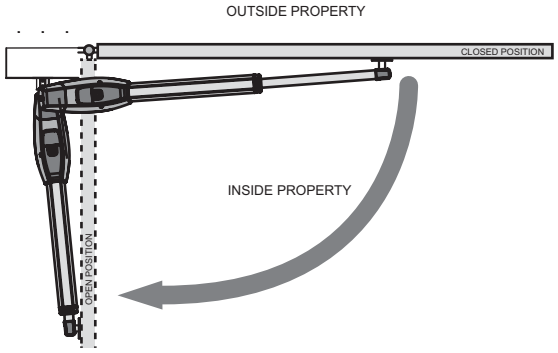
GATE OPENING DIRECTION SETTING

- Use OPEN IN/OUT dipswitch (#8) to change the opening direction of the operator.
- The direction of gate opening is determined from behind the gate operator.
- LEDs will show opening and closing direction when the gate is moving.

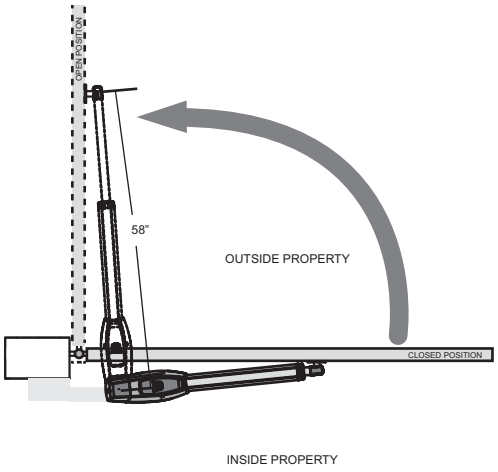
- OPEN IN/OUT switch “OFF” is for open in installations
- OPEN IN/OUT switch “ON” is for push out installations



OPEN IN



OPEN OUT



PROGRAMMABLE RELAY

SETTING THE AUXILIARY RELAY

- From the SETTINGS menu, select AUXILIARY RELAY and press ENTER
- Use the up and down arrows to select the function and press ENTER
- If PRE-WARN SIGNAL was selected, you must set the delay. use the up and down arrows to set the pre-warn delay and press ENTER to save.
- NOTE: An asterisk (*) will appear on the selected function

RELAY ACTIONS: Set the action of the relay function.

OFF: Relay is inactive

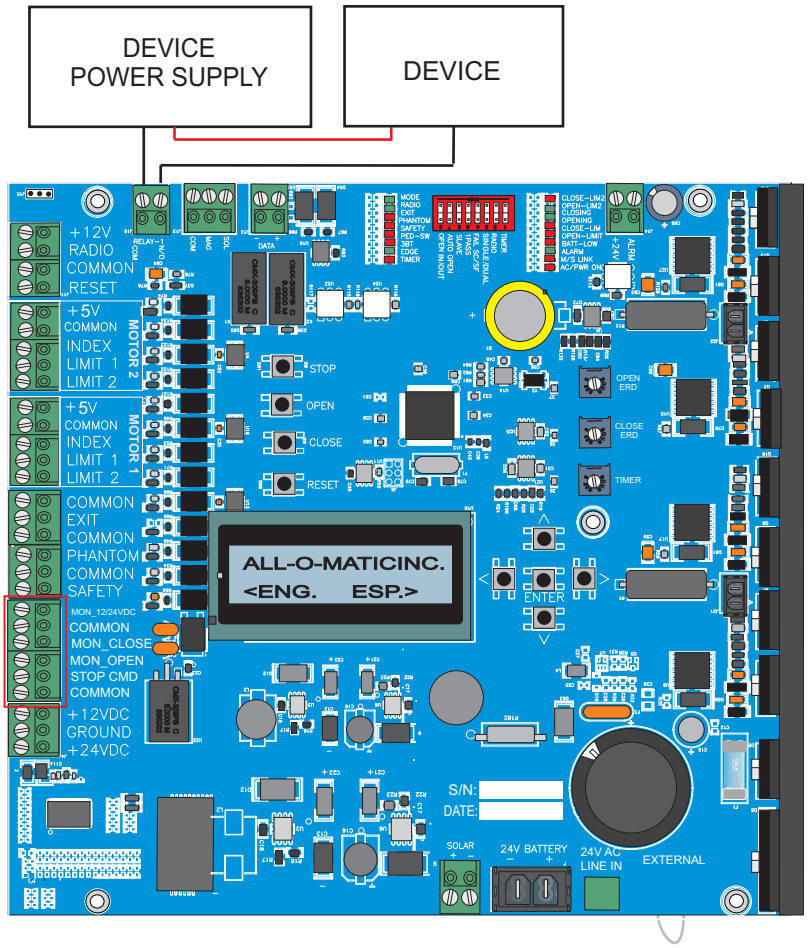
PRE-WARN SIGNAL: Relay is used to turn on a strobe light or siren with a delay before the gate starts moving. Adjustable up to 6 seconds.

MOVING SIGNAL: Relay is on and kept active while the gate is in motion.

ALARM SIGNAL: Relay is on when the gate has been tampered with. This is used as an alarm sensor output.

OPENED SIGNAL: Relay is on and kept active when the gate is in the fully open position.

CLOSED SIGNAL: Relay is on and kept active when the gate is in the fully closed position.

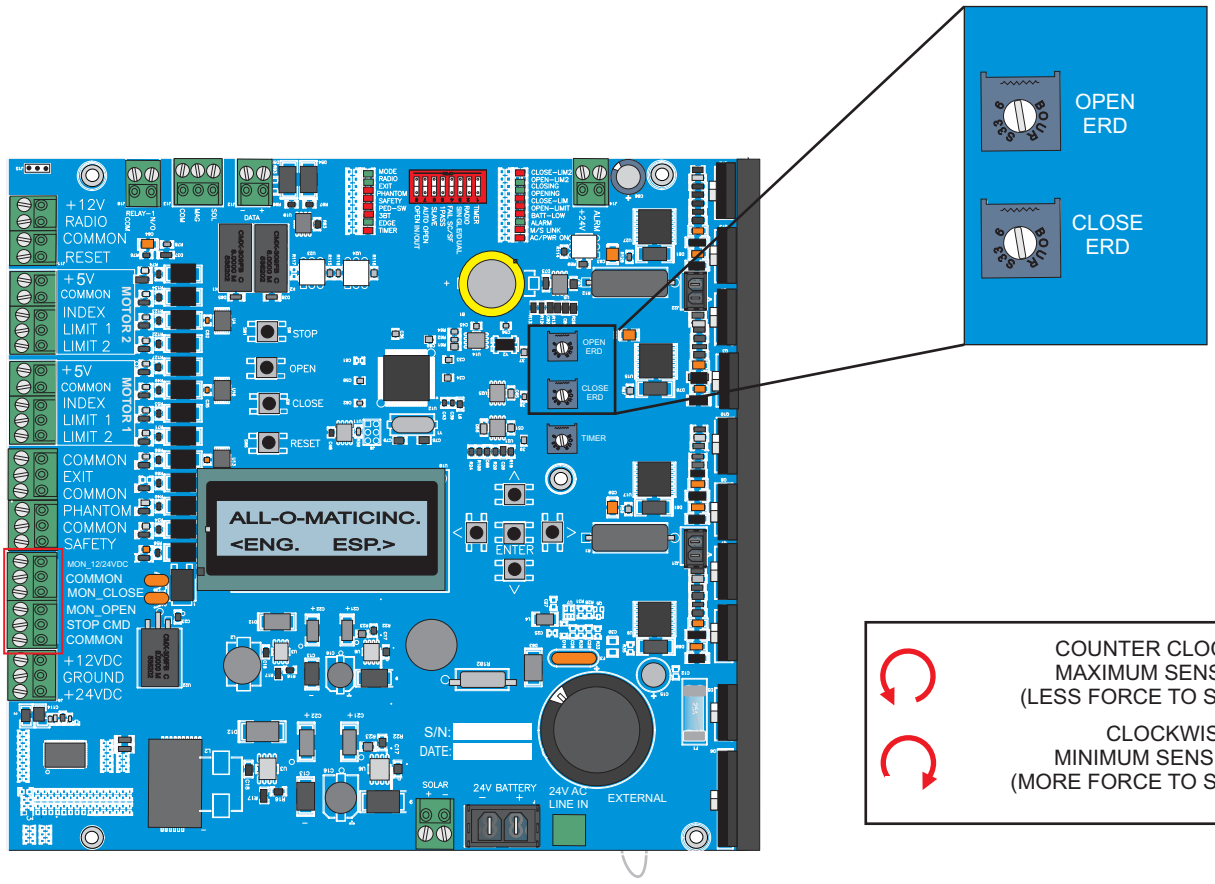


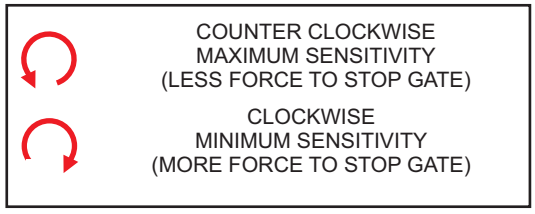
ELECTRONIC REVERSING DEVICE (ERD) ADJUSTMENT

All of our boards are equipped with an Electronic Reversing Device (ERD), which will cause the gate to reverse direction when it comes into contact with an obstruction.

The amount of force required to reverse the gate's direction depends on the ERD sensitivity setting.

If the gate reverses direction on its own without hitting an obstruction, the ERD is too sensitive. If the gate does not reverse when it hits an obstruction, the ERD is not sensitive enough.





TIMER ADJUSTMENT AND RADIO SETTING

TIMER ON: Automatic timer to close can be set from 1 to 60 seconds

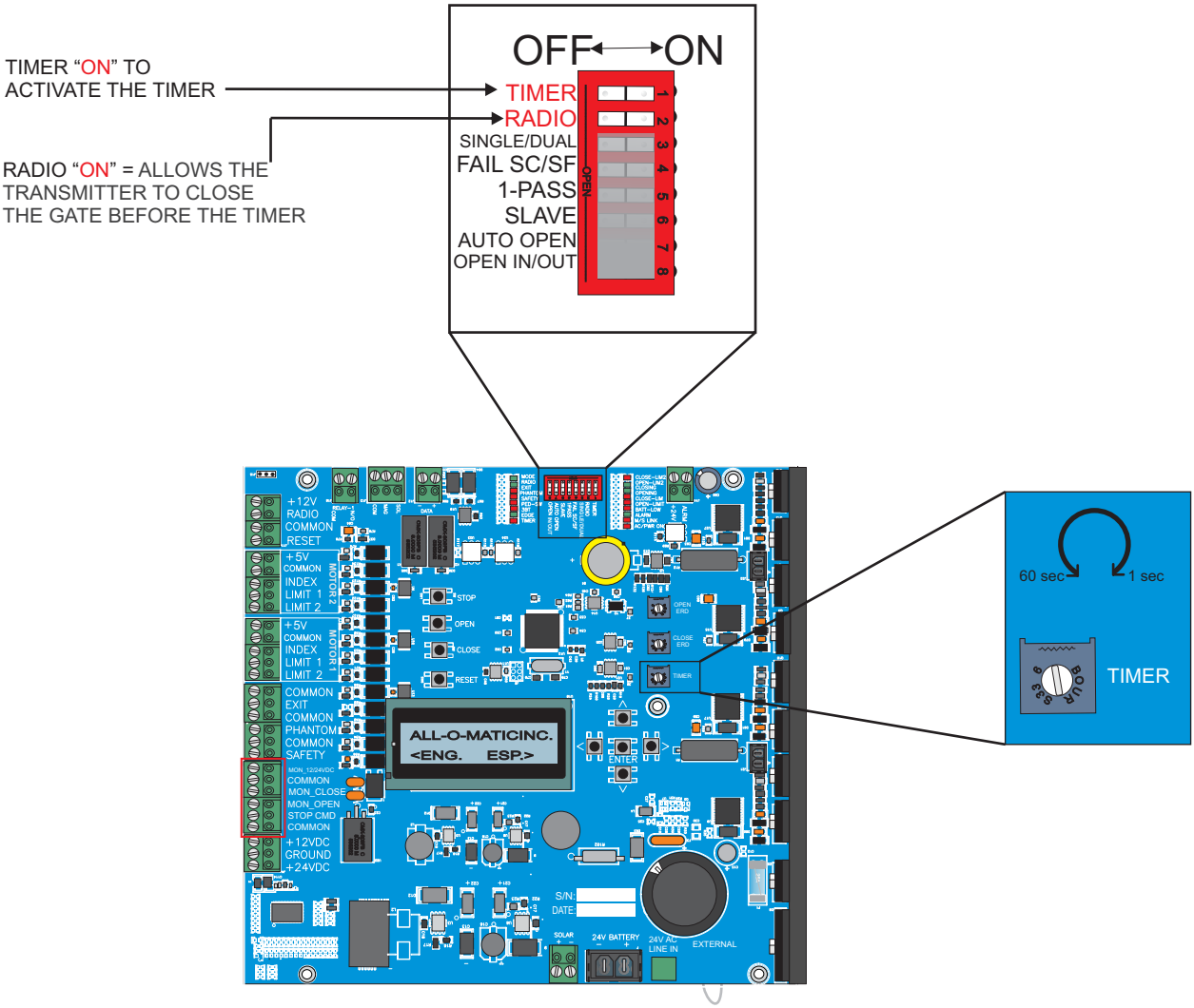
TIMER OFF: Gate operation is “push button to open, push button to close”

RADIO ON: To override the timer and allow the radio receiver to close the gate before the timer

Turn potentiometer counter clockwise for more time

Turn potentiometer clockwise for less time

NOTE: The timer may not activate to close the gate if the potentiometer is turned counter clockwise all the way



DIP SWITCH FUNCTIONS

TIMER
TIMER switch **"ON"** activates the automatic close timer.

RADIO
RADIO switch **"ON"** allows the radio receiver to override the automatic close timer.

SINGLE/DUAL
SINGLE/DUAL switch **"ON"** is for a dual gate application. **SINGLE/DUAL** switch **"OFF"** is for a single gate application.

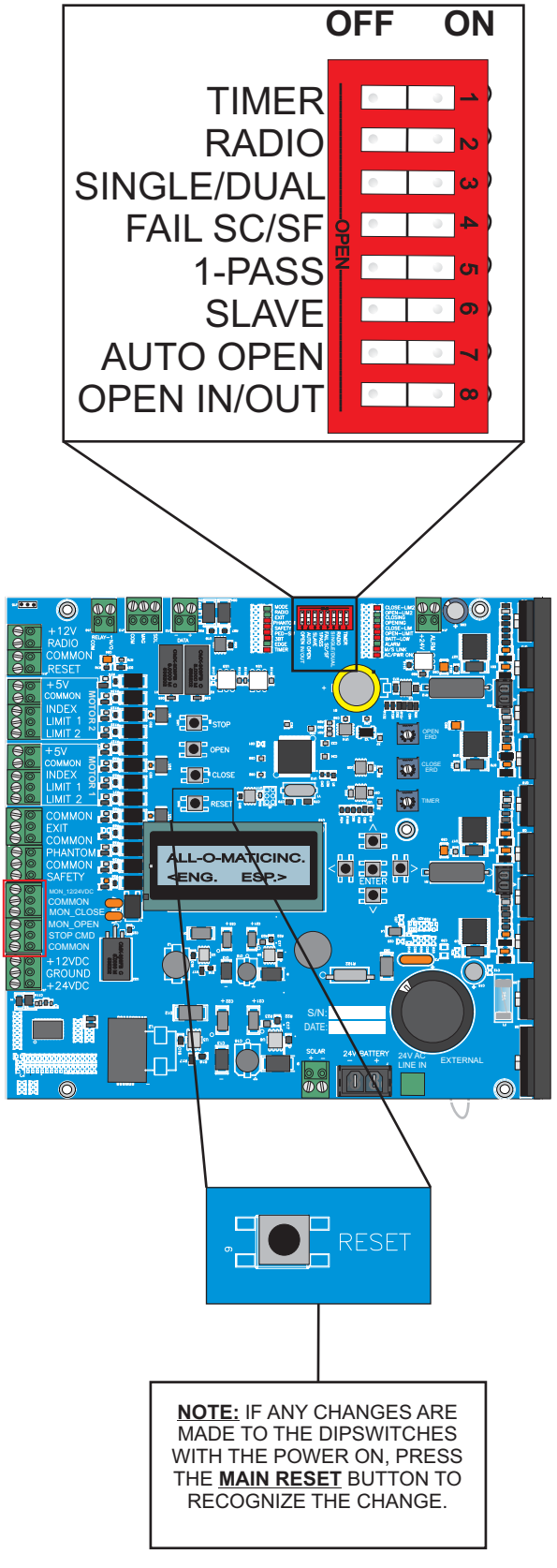
FAIL SC/SF
FAIL SC/SF switch **"ON"** is for fail safe operation. Upon power failure, board will monitor battery voltage to make sure the gate opens before battery completely drains. **FAIL SC/SF** switch **"OFF"** is for fail secure operation. Upon power failure, gate will run until the battery is low and lock closed.

1-PASS
1-PASS switch **"ON"** allows the gate to open until one vehicle goes over the safety loop. Once the vehicle has cleared the loop, the gate will stop and close. If a second vehicle goes over the loop while the gate is closing, the gate will stop. The vehicle must get off of the loop before the gate continues to close, forcing the second vehicle to present valid credentials. This is a true one pass, anti-tailgating feature to be used with safety loops.

SLAVE
SLAVE is mislabeled on this board version. Use the **SINGLE/DUAL** switch to determine single or dual application. The **SLAVE** switch works as an OSC feature. **"ON"** allows the radio receiver to stop and reverse the gate in any direction. During a cycle, the first signal stops the gate. A second signal reverses the gate.

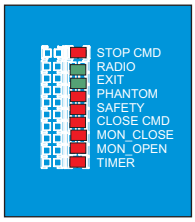
AUTO OPEN
AUTO OPEN switch **"ON"** allows the gate to open automatically upon power interruption. This feature is used in areas where the fire department requires the gate open automatically after a power outage.

OPEN IN/OUT
OPEN IN/OUT switch **"ON"** is used for push to open installations. The **"OFF"** position is used for pull to open installations.



NOTE: IF ANY CHANGES ARE MADE TO THE DIPSWITCHES WITH THE POWER ON, PRESS THE **MAIN RESET** BUTTON TO RECOGNIZE THE CHANGE.

LED DIAGNOSTICS



STOP CMD
ON when the STOP CMD input is activated.
(open circuit to common)

RADIO
ON when the RADIO input is activated.
(closed circuit to common)

EXIT
ON when the EXIT input is activated.
(closed circuit to common)

PHANTOM
ON when the PHANTOM input is activated.
(closed circuit to common)

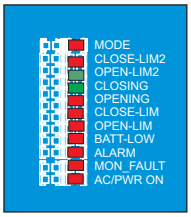
SAFETY
ON when the SAFETY input is activated.
(open circuit to common)

CLOSE CMD
ON when the CLOSE CMD input is activated.
(closed circuit to common)

MON_CLOSE
ON when the MON_CLOSE input is activated or when a device is not installed.
(open circuit to common)

MON_OPEN
ON when the MON_OPEN input is activated or when a device is not installed.
(open circuit to common)

TIMER
Blinks when the timer is counting down to close automatically.



MODE
Blinks **once** every two seconds when there is a problem with the **motor hall sensor** feedback. Blinks **twice** every two seconds when a **motor overload** is detected. Blinks **three times** every two seconds when the game is **jammed**.

CLOSE-LIM2
ON when the CLOSE LIMIT on MOTOR 2 is activated.

OPEN-LIM2
ON when the OPEN LIMIT on MOTOR 2 is activated.

CLOSING
ON when the board is sending power to MOTOR 1 and/or MOTOR 2 for the closing direction.

OPENING
ON when the board is sending power to MOTOR 1 and/or MOTOR 2 for the opening direction.

CLOSE-LIM
ON when the CLOSE LIMIT on MOTOR 1 is activated.

OPEN-LIM
ON when the OPEN LIMIT on MOTOR 1 is activated.

BATT-LOW
ON when the batteries are low.

ALARM
Blinks every 30 seconds (alarm will also beep) when the batteries are low, bad, or disconnected. Turns on for 5 minutes (alarm also goes off) when the operator goes into shut down mode due to the gate hitting an obstruction (ERD).

MON_FAULT
ON when there is an issue with the monitored entrapment device. Check device wiring and alignment.

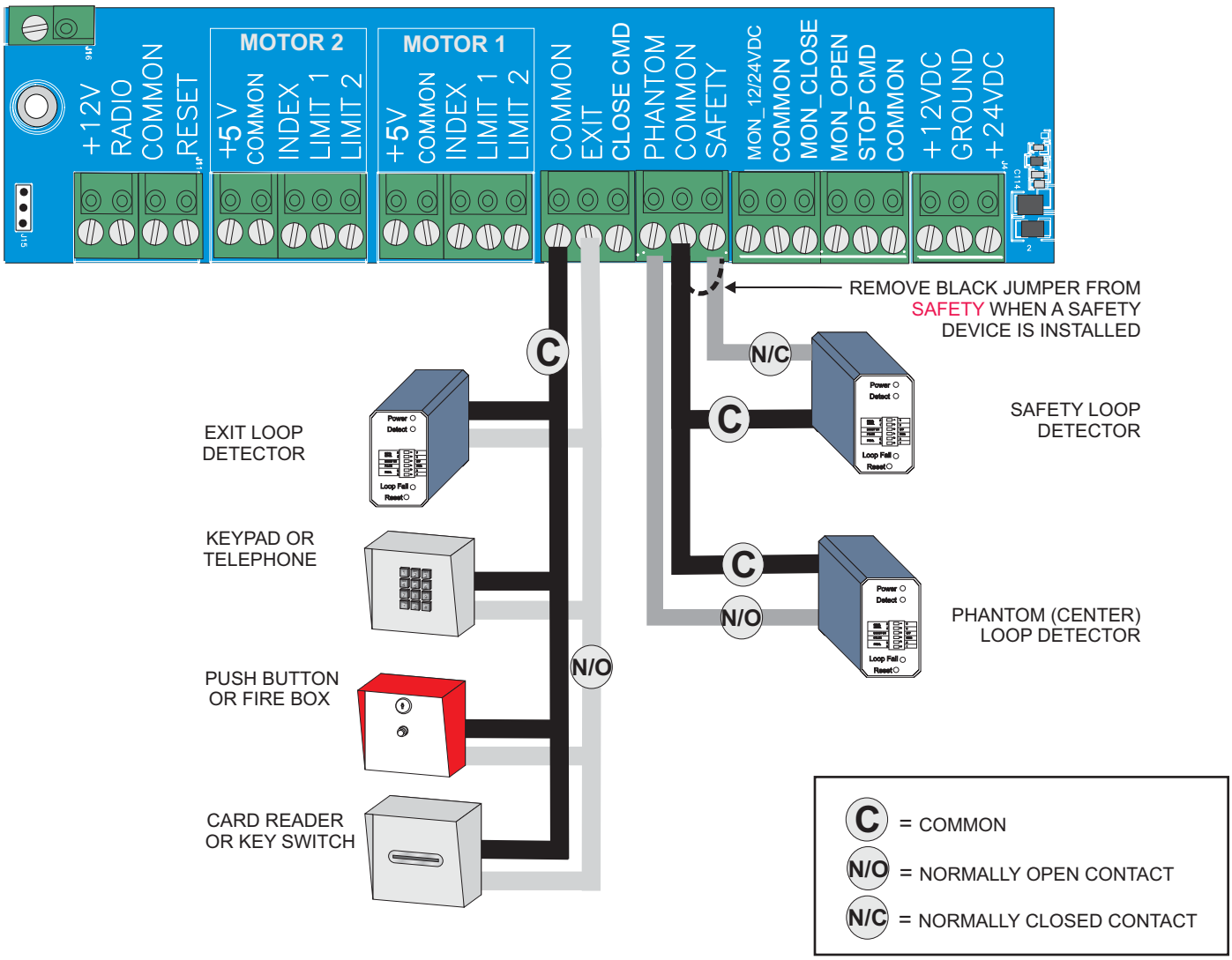
AC/PWR ON
ON when AC power is on.

ACCESSORY CONNECTIONS

The circuit board has a 24 VDC terminal that provides up to 500 mAmps to power accessories such as loop detectors, keypads, etc. If the total current draw of your accessories exceeds the 500 mAmps, a separate power supply (transformer) is required.

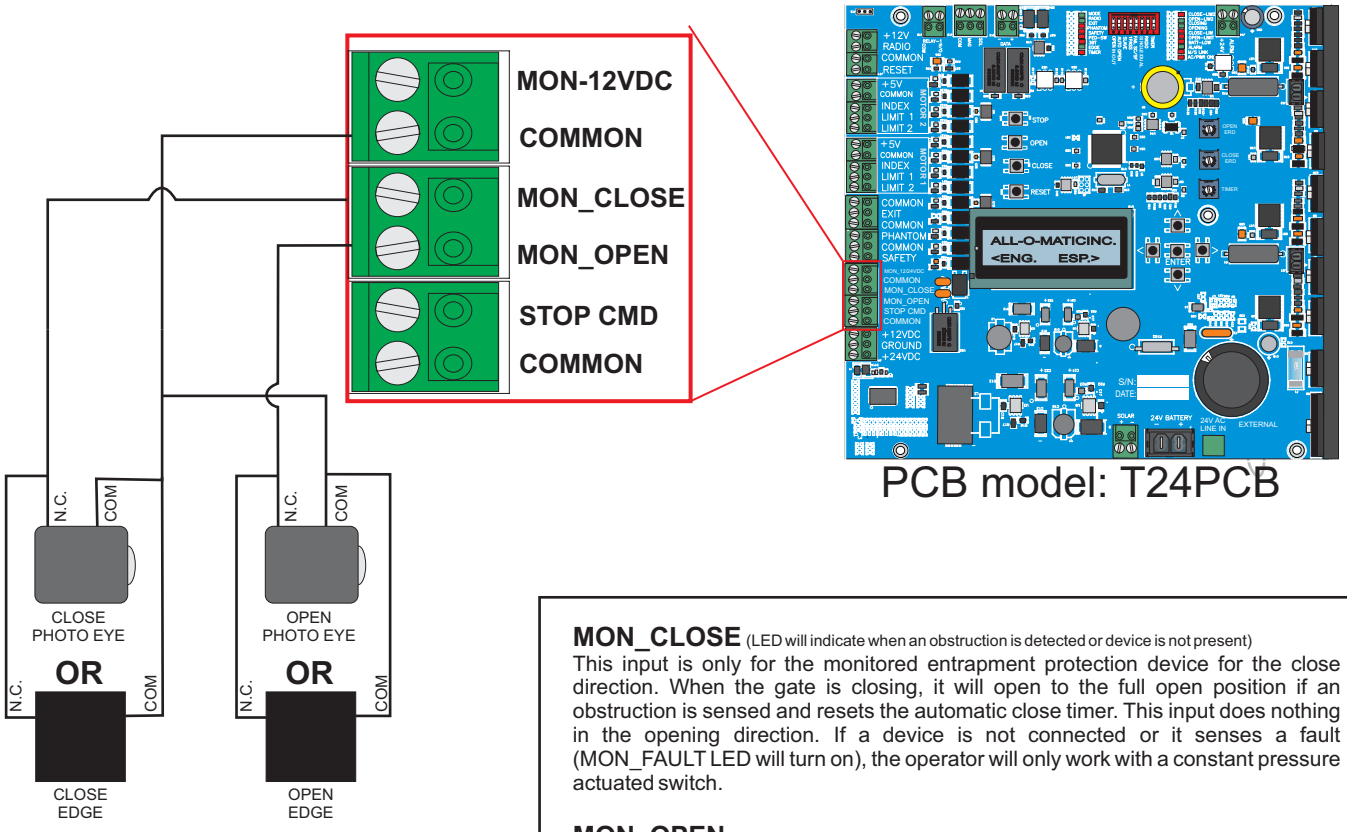
When installing a safety photo eye, safety loop detector, or pedestrian switch, make sure to remove the black jumper between the 24V-COM and SAFETY and/or PED-SW terminals.

NO Contacts	NC Contacts
Exit Loop Detector	Safety Loop Detector
Keypad	Safety Photo Eye
Telephone System	Pedestrian Switch
Push Button	
Card Reader	



MONITORED ENTRAPMENT PROTECTION DEVICE CONNECTIONS

- There are 2 types of sensors that can be connected to the gate operator for UL 325 monitored entrapment compliance: non-contact sensors (photo eye) and contact sensors (edge sensors).
- Monitored entrapment protection devices use 4 wires to connect to the board. From the device, connect the **RELAY COMMON** to the board **COMMON** and the **NORMALLY CLOSED** relay contact to the assigned **MON_OPEN** or **MON_CLOSE** input. Connect the power wires to the **COMMON** and **MON-24VDC.**
- **IMPORTANT:** You must use the MON-24VDC to properly monitor entrapment protection devices. Do not use the 24 VAC terminal on the board's terminal strip.
- Please refer to the device manufacturer wiring instructions for details, making sure to follow the normally closed wiring directions. Some devices may work on monitoring interfaces other than normally closed.
- Should there be a need for more than 1 entrapment protection device for each direction, use a multi-input module from Miller Edge (model: MIM-62).



PCB model: T24PCB

MON_CLOSE (LED will indicate when an obstruction is detected or device is not present)
This input is only for the monitored entrapment protection device for the close direction. When the gate is closing, it will open to the full open position if an obstruction is sensed and resets the automatic close timer. This input does nothing in the opening direction. If a device is not connected or it senses a fault (MON_FAULT LED will turn on), the operator will only work with a constant pressure actuated switch.

MON_OPEN (LED will indicate when an obstruction is detected or device is not present)
This input is only for the monitored entrapment protection device for the open direction. When the gate is opening, it will reverse for 2 seconds and stop if it senses an obstruction. This input does nothing in the closing direction. Upon power up, if a device is not detected, the operator will assume that one is not required for the opening direction. If a device is connected and the board detects a fault (MON_FAULT LED will turn on), the operator will only work with a constant pressure actuated switch.

MONITORED ENTRAPMENT PROTECTION DEVICE CONNECTIONS

ENFORCER E-960-D90GQ/ E-931-S33RRGQ / E-931-S50RRGQ	
CONTACT	**BOARD TERMINAL**
N.C.	MON_CLOSE OR MON_OPEN
COM	COMMON
12-30 VDC/AC	COMMON
12-30 VDC/AC	MON_12/24VDC

ENFORCER E-936-S45RRGQ	
WIRE	**BOARD TERMINAL**
BLACK	MON_CLOSE OR MON_OPEN
WHITE	COMMON
BLUE	COMMON
BROWN	MON_12/24VDC

ALLEN BRADLEY GRU-24	
WIRE	**BOARD TERMINAL**
BLACK	MON_CLOSE OR MON_OPEN
ORANGE	COMMON
BLUE	COMMON
BROWN	MON_12/24VDC

OMRON E3K-R10K4-NR		
SWITCH	**CONTACT**	**BOARD TERMINAL**
LIGHT ON	N.O.1	MON_CLOSE OR MON_OPEN
	COM	COMMON
	24 TO 240 VAC	COMMON
	24 TO 240 VAC	MON_12/24VDC

EMX IRB-RET / IRB-MON		
SWITCH	**CONTACT**	**BOARD TERMINAL**
SW1 - OFF	N.C.	MON_CLOSE OR MON_OPEN
SW2 - OFF	COM	COMMON
SW3 - OFF	POWER/ VRX	COMMON
SW4 - ON	POWER/ VRX	MON_12/24VDC

EMX IRB-325	
CONTACT	**BOARD TERMINAL**
N.C.	MON_CLOSE OR MON_OPEN
COM	COMMON
POWER	COMMON
POWER	MON_12/24VDC

EMX NIR-50	
WIRE	**BOARD TERMINAL**
BLACK	MON_CLOSE OR MON_OPEN
WHITE	COMMON
BLUE	COMMON
BROWN	MON_12/24VDC

TRANSMITTER SOLUTIONS R50R-UL/R32P-UL/SR33HD/SR66HD	
CONTACT	**BOARD TERMINAL**
N.C. (3)	MON_CLOSE OR MON_OPEN
COM (5)	COMMON
NON POLARITY (1)	COMMON
12-30 VDC/AC (2)	MON_12/24VDC

MILLER EDGE REFLECTI-GUARD/RG-K	
CONTACT	**BOARD TERMINAL**
TB 2 - N.C.	MON_CLOSE OR MON_OPEN
TB 2 - COM	COMMON
TB 1 - POWER IN (-)	COMMON
TB 1 - POWER IN (+)	MON_12/24VDC

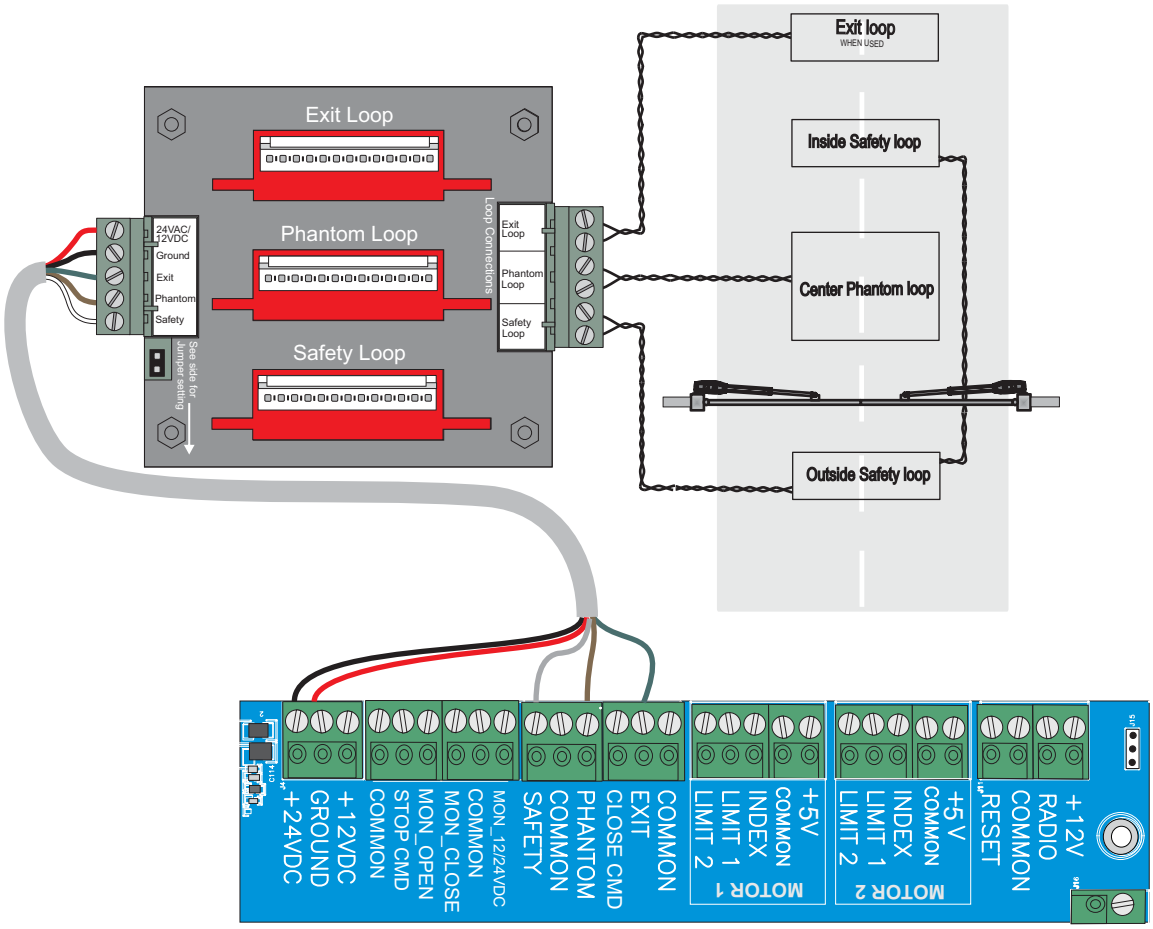
TRANSMITTER SOLUTIONS iGAZE RE KIT		
SWITCH	**CONTACT**	**BOARD TERMINAL**
ALL OFF	N.C.1	MON_CLOSE OR MON_OPEN
	COM	COMMON
	(-) 12/24 VDC	COMMON
	(+) 12/24 VDC	MON_12/24VDC

EMX WEL-200	
CONTACT	**BOARD TERMINAL**
RELAY CLOSE (NC) RELAY OPEN (NC)	MON_CLOSE MON_OPEN
RELAY CLOSE (COM) RELAY OPEN (COM)	COMMON COMMON
POWER	COMMON
POWER	MON_12/24VDC

MILLER EDGE RBAND MINIMUM 6 WIRES REQUIRED		
SWITCH	**CONTACT**	**BOARD TERMINAL**
SW 1 - ON	CS 1 CS 2	MON_CLOSE MON_OPEN
SW 2 - OFF	CS 1 CS 2	COMMON COMMON
SW 3 - ON	COM.A TEST	COMMON MON_12/24VDC
SW 4 - ON	12/24 (+) AC/DC	24-VDC GROUND

PLUG-IN DETECTOR INSTALLATION

- The Toro operator comes equipped with the pre-wired LPR-1 loop rack for safety, phantom, and exit plug in loop detectors, making installation quick and efficient.
- Hardwired loop detectors with harnesses can also be installed. The circuit board has 12 VDC and 24 VDC terminals to power the detector of your choice. See “Accessory Connections” page for wiring instructions.
- Wire one or more safety devices in series with the loop rack wires. To do this, remove the white wire (N.C) from the loop rack off of the SAFETY terminal on the circuit board and wire nut to the COM of the additional device. The N.C. contact of the additional device will now go on the SAFETY terminal of the board.
- **IMPORTANT:** Use different frequencies for each loop detector to eliminate interference.



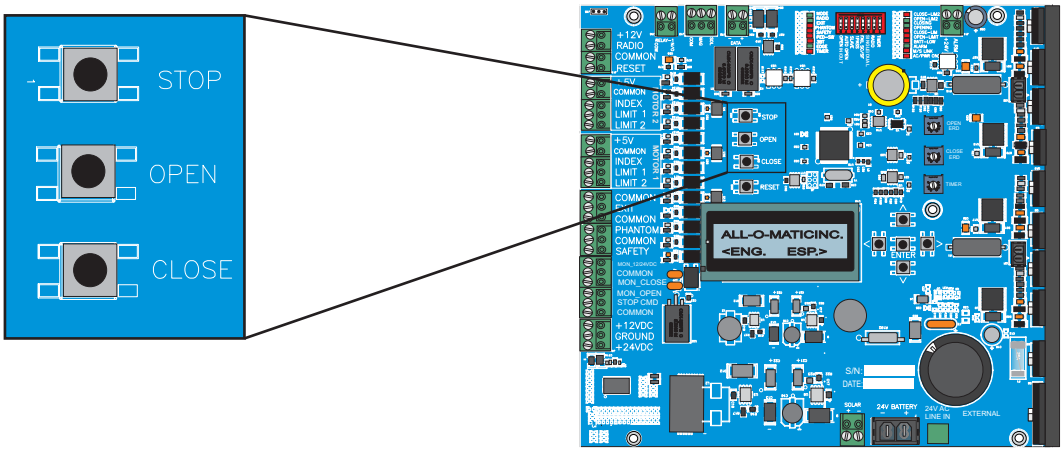
LOOP RACK	DC BOARD	WIRE COLOR
12VDC	12-VDC	RED
GROUND	GROUND	BLACK
EXIT	EXIT	GREEN
PHANTOM	PHANTOM	BROWN
SAFETY	SAFETY	WHITE

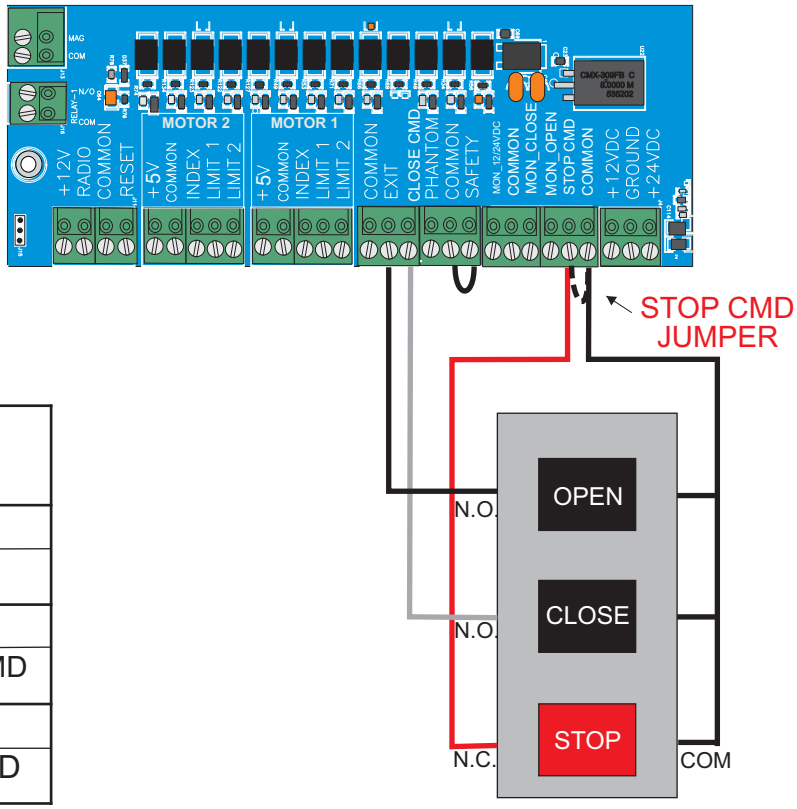
COMPATIBLE PLUG IN DETECTORS

BRAND	MODEL	JUMPER SETTING
RENO A&E	H2	OFF
EDI	LMA-1800	OFF
DIABLO	DSP-40S	ON
DIABLO	DSP-55	OFF
DIABLO	DSP-50	OFF
NORTHSTAR	NP2-ES	ON

THREE BUTTON STATION CONNECTION

- A three button station and reset push button are integrated on the board to make limit and ERD adjustments easier.
- An external three button station may also be installed. See diagram below for wiring instructions,
- **NOTE:** STOP CMD jumper must be removed if a three button station is installed.





Push Button	Contacts	Terminals
Open	Common	24V-COM
	Normally Open	EXIT
Close	Common	24V-COM
	Normally Open	CLOSE CMD
Stop	Common	24V-COM
	Normally Closed	STOP CMD

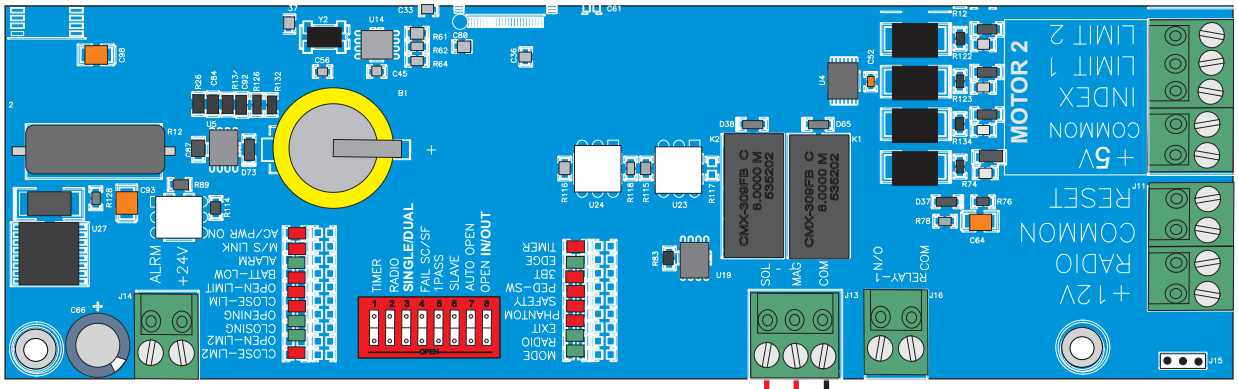
MAGNECTIC/SOLENOID LOCK CONNECTION

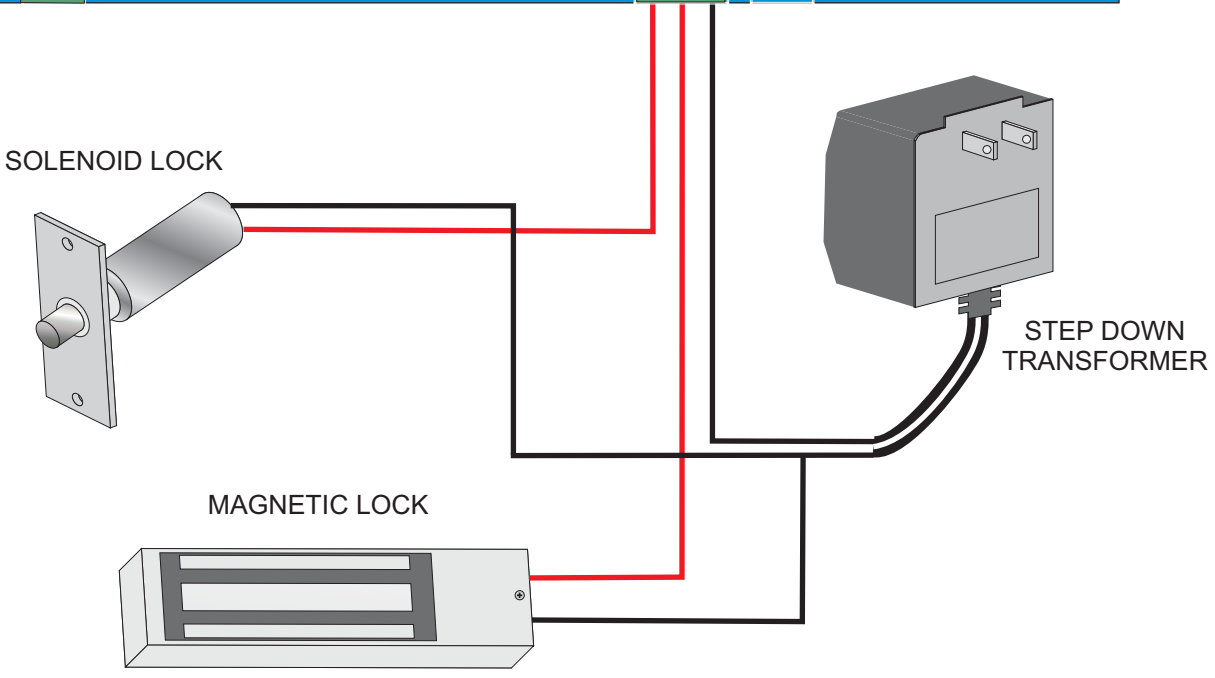
Magnetic lock installation requires a step down transformer with the appropriate voltage for the specific lock accessory.

Connections: Plug the lock device transformer to the 120VAC outlet plug.

For Magnetic Lock: Wire nut one wire from transformer directly to one wire of the magnetic lock. The other wire from transformer will be connected to the board relay plug COM input and the other wire of the magnetic lock connects to the board MAG relay output. See illustration below.

For Solenoid Lock: Wire nut one wire from transformer directly to one wire of the solenoid lock. The other wire from transformer will be connected to the board relay plug COM input and the other wire of the solenoid lock connects to the board SOL relay output. See illustration below.

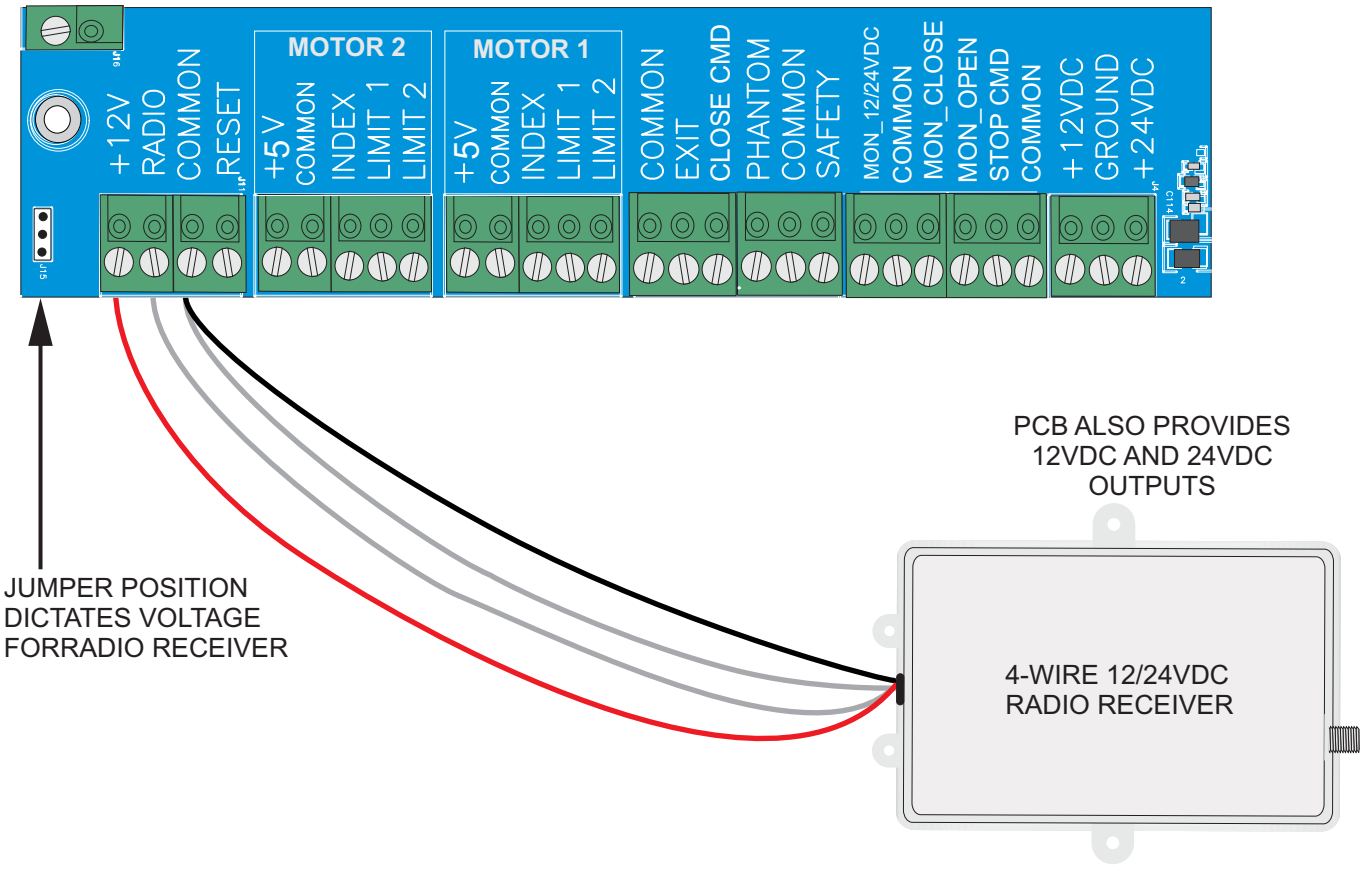




RADIO RECEIVER CONNECTION

3-wire receiver connections:
- Connect terminal 1 (common) to COMMON on the radio plug
- Connect terminal 2 (relay) to RADIO on the radio plug
- Connect terminal 3 (12/24V) to +12/24V on the radio plug

4-wire receiver connections:
- Connect the 2 gray (relay wires) to the RADIO and COMMON on the radio plug
- Connect the black (common/negative) to the COMMON on the radio plug
- Connect the red (power/positive) to the +12/24V of the radio plug



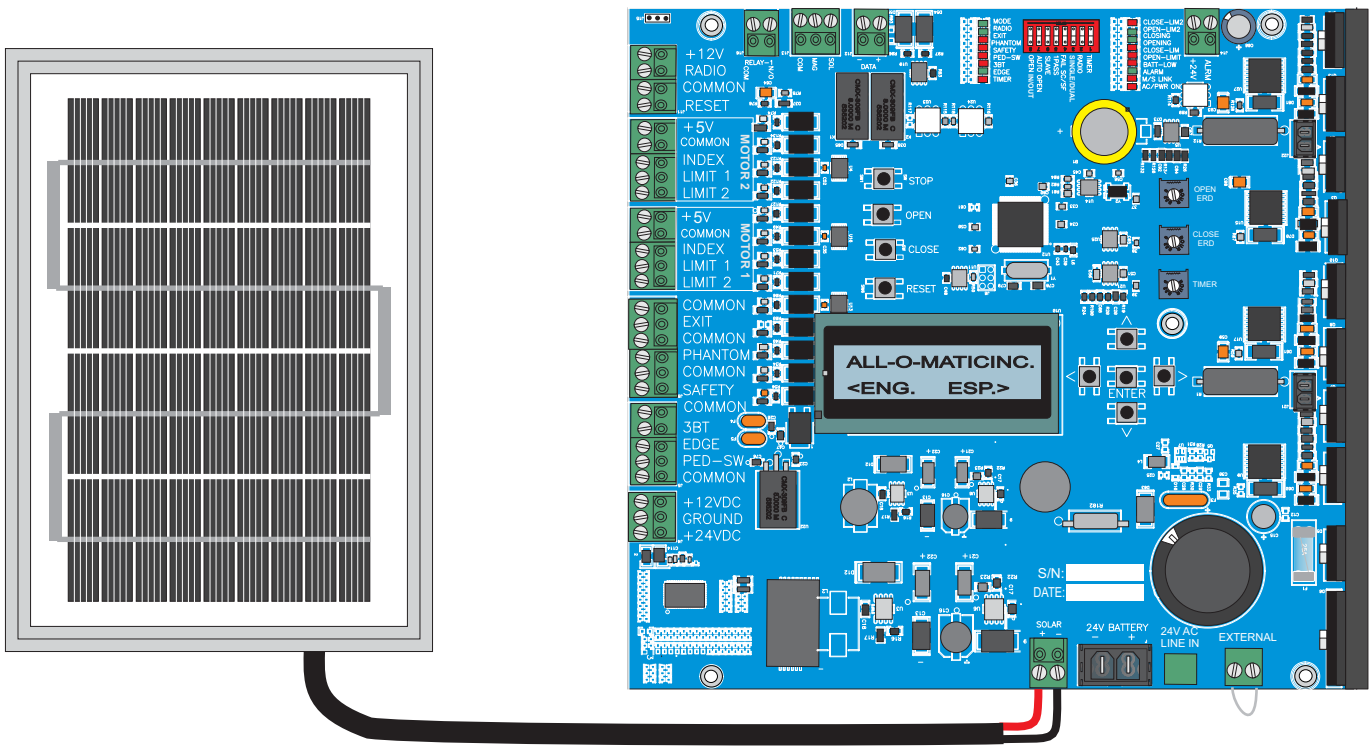
SOLAR PANEL CONNECTION

The solar panel input will accept a 24VDC panel or (2) 12VDC panels wired in series to make 24VDC.

The on board charger is limited to 80 watts. For applications that require more than 80 watts, and external charger is required. See next page to wire an external charger to the board.

For a solar installation, upgrade the batteries according to usage.

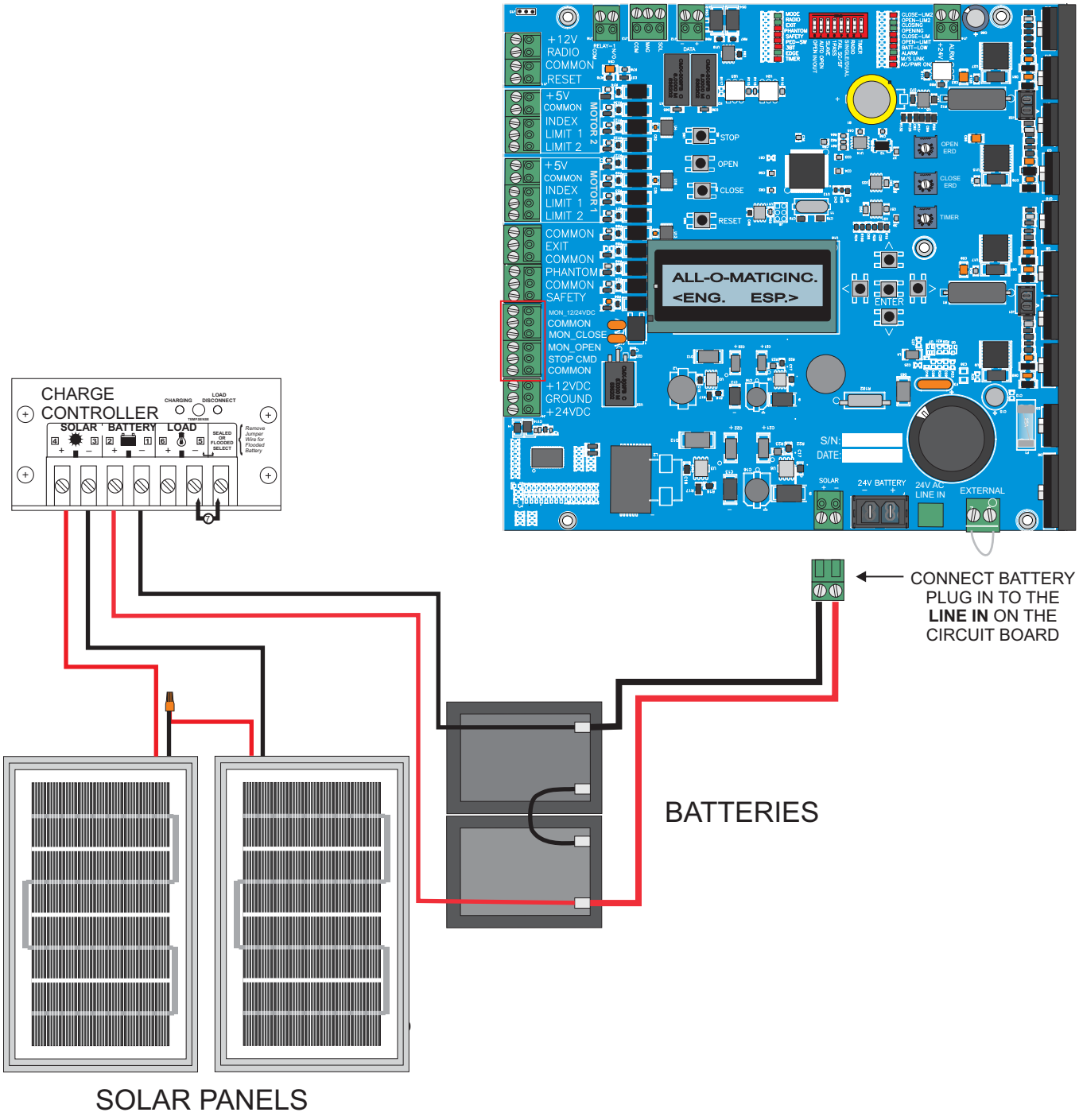
For information on solar applications (solar panel sizes, battery size, etc.), please call ALL-O-Matic.



EXTERNAL SOLAR SYSTEM INSTALLATION

When using an external solar package, connect batteries straight into the **LINE IN** input. The batteries will need to be upgraded according to usage. See wiring below.

For information on solar applications (solar panel sizes, battery size, etc.), please call ALL-O-Matic.



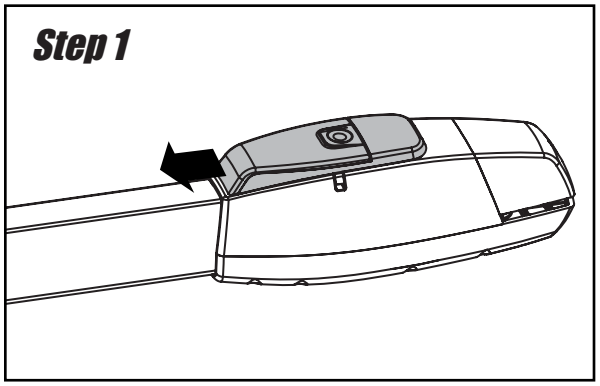
EMERGENCY RELEASE

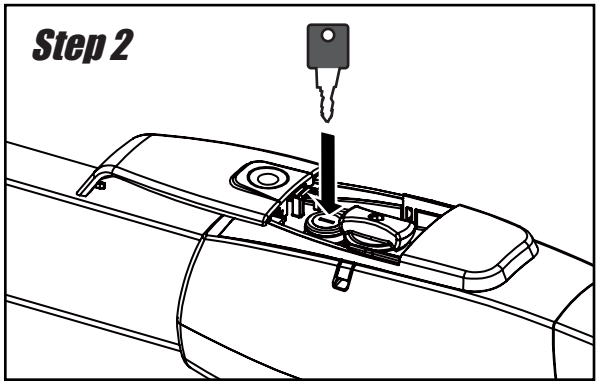
To release the gate for manual operation, follow these steps:

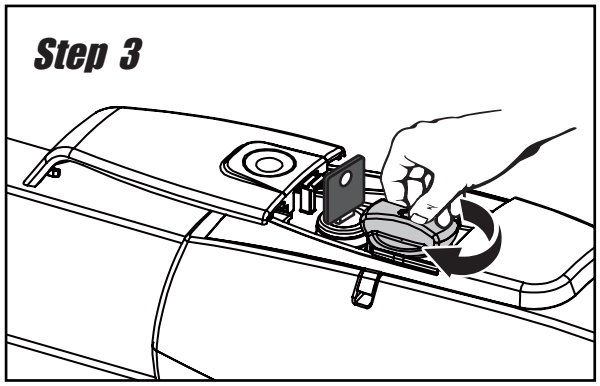
1. Slide the cover of the release compartment forward.
2. Insert the key and turn the key clockwise to the unlock position.
3. Turn the knob clockwise to release the motor.

NOTE: Make sure the white bar on the knob is on the position opposite the triangle indicator.

To put the operator back into normal operation, reverse the steps above.







WARRANTY AND RECORD

MANUFACTURER'S LIMITED WARRANTY

ALL-O-MATIC INC warrants the following gate operators (SL-90 DC, SL-100 DC, SL-150 DC) for a period of five (5) years in commercial installations and for a period of seven (7) years in residential installations. The SL-45DC will have warranty period of five (5) years in residential installations. The above operators, within their warranty period, are to be free from defects in circuitry, motor, gearbox and workmanship. This warranty begins from the date of purchase to the original owner. Warrantor will repair or, at its option, replace any device which it finds to require service. This device must be sent to the warrantor at the consumer's expense to:

ALL-O-MATIC INC.
7820 GLORIA AVE.
VAN NUYS, CA 91406

The warrantor will return the repaired or replaced unit to the customer at the consumer's expense. Labor charges for dealer service or replacement are the responsibility of the owner. These warranties are in lieu of all other warranties either expressed or implied, and ALL-O-MATIC INC shall not be liable for consequential damage. All implied warranties of merchantability and or fitness for a particular purpose are hereby disclaimed and excluded. This limitation is not valid in jurisdictions which do not allow limitation of incidental or consequential damages or limitation of warranty periods. In order to obtain this policy, please complete the registration card and send it by mail within 30 days of purchasing from ALL-O-MATIC INC. or your installer. If product is not registered, only a one year warranty on all parts will be provided.

CUSTOMERS RECORD

Customer Name_____

Address_____

Purchased from (Installation Co.)_____

Date____/___/_____

Model Number_____

Serial Number_____-_____