

# ALL-O-MATIC®



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UL325  
compliant

UL991  
compliant

## SW-300DC Installation Manual

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## IMPORTANT SAFETY INSTRUCTIONS

# WARNING

### To reduce the risk of injury:

READ THE FOLLOWING DIRECTIONS. DO NOT EVEN THINK OF STARTING UNTIL YOU HAVE READ AND UNDERSTAND THESE DIRECTIONS. IF THERE IS SOMETHING YOU DO NOT UNDERSTAND CALL US.

Never let children operate or play with gate controls. Keep the remote control away from children.

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

This operator must be tested monthly. The gate must reverse on contact with a ridged object or stop when an object activates the non-contact sensors. After adjusting the force or the limit travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury.

Keep gates properly maintained. Have a qualified service person make repairs to gate hardware. It takes many years of experience to make proper adjustments to gate hardware or operators.

There is nothing on a gate operator that is easily repaired without a great deal of experience. Save yourself some time and call a qualified Gate Service Contractor who knows your type of gate operator.

## INSTALL THE GATE OPERATOR ONLY WHEN YOU HAVE READ THE FOLLOWING:

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- \*Confirm that the gate operator being installed is appropriate for the application.
- \*Confirm that the gate is designed and built according to current published industry standards.
- \*Confirm that all appropriate safety features and safety accessory devices are being incorporated, including both primary and secondary entrapment protection devices.
- \*Make sure that the gate works freely before installing the operator.
- \*Repair or service worn or damaged gate hardware before installation of the operator.
- \*Eliminate all gaps in a sliding gate below a 4 foot height that permits a 2 ¼ inch sphere to pass through any location, including the area of the adjacent fence covered when the gate is in the open position.
- \*Eliminate all gaps in a swinging gate below a 4 foot height that permit a 4 inch sphere to pass through any location, including the hinge area of the gate.
- \*Operator must be disconnected from the power source before attempting any installation of accessories.
- \*Install this gate operator according to our installation instructions.
- \*Adjust the operator clutch or load sensing device to the minimum force setting that will still allow for reliable gate operation.
- \*Install the operator inside the fence line(do not install the operator on the public side of fence line).
- \*Install a proper electrical ground to a gate operator.
- \*Install controls where users cannot touch or reach through the gate to operate the controls.
- \*Install all warning signs and take pictures of the installation.
- \*Test all safety features for proper function before placing the automatic vehicular gate into service.
- \*Train owner/users about basic functions and safety features of the gate system, including how to turn off the power and how to operate the manual disconnect feature.
- \*Leave safety instructions, product literature, installation manual and maintenance manual with end user.
- \*Explain to the owner/user the importance of routine service and retesting on a monthly basis.

# DIFFERENT UL 325 CLASS TYPES

## **Class one: Residential**

A vehicle gate operator intended for use at a home of one to four single family dwellings, garages or parking area.

## **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, other buildings 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 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 where unauthorized access is prevented via supervision by security personnel.

## **Other components required to satisfy UL 325**

Each class must have a primary and secondary means to sense and react to obstructions within two seconds.

## **The six types of obstruction sensing systems are:**

### **Type A:**

Inherent obstruction sensing system. This system must sense and initiate the reverse of the gate within two seconds of contact with a solid object.

### **Type B 1:**

Provision for connection of a non-contact device can be used, such as a secondary protection.

### **Type B2:**

Provision for connection of a contact sensor. Examples include an edge device or equivalent. This can be used for secondary protection.

### **Type C:**

Inherent adjustable clutch or pressure relief valve.

### **Type D:**

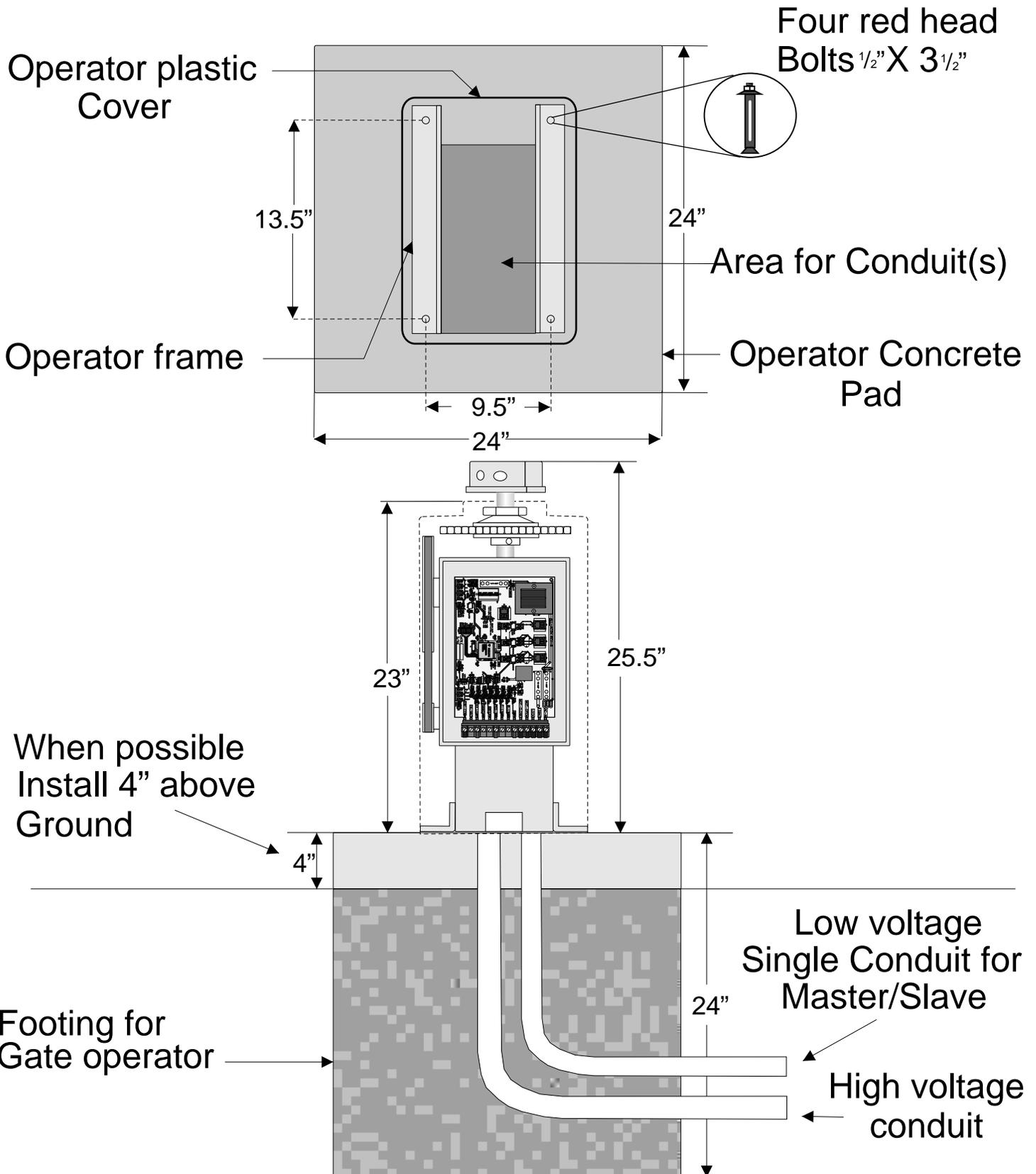
Provision for connection of or provided with and actuation device requiring continuous pressure.

### **Type E:**

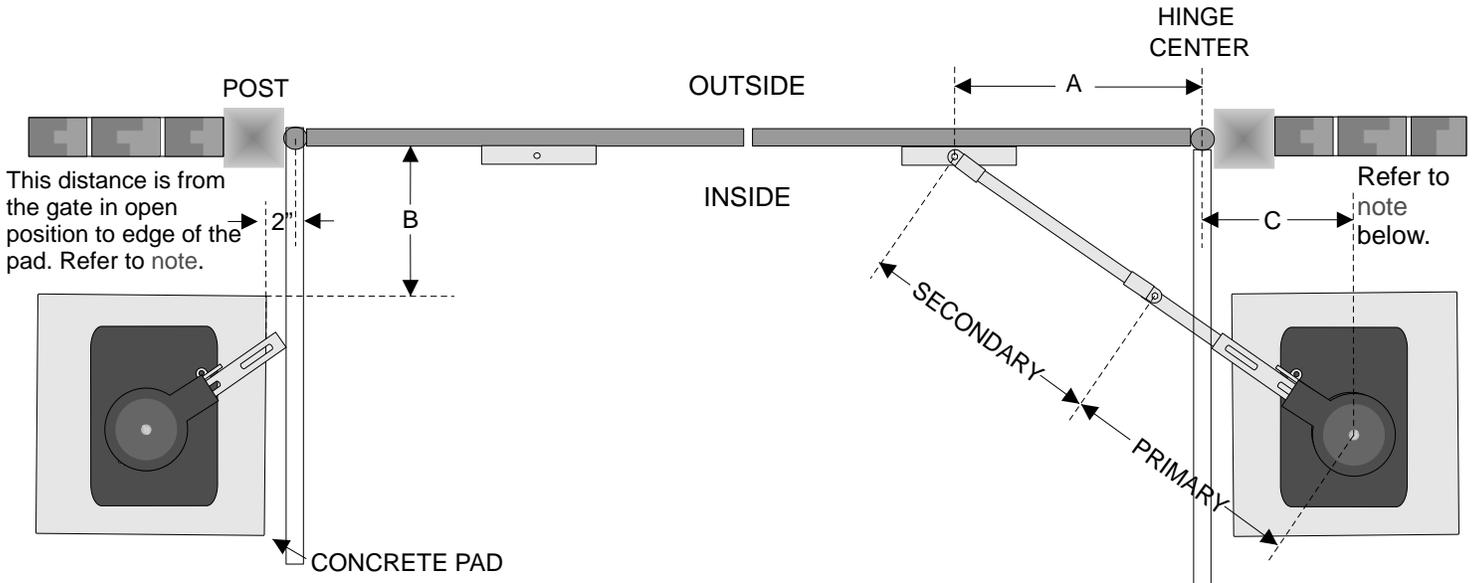
Inherent audio alarm.

**All of All-O-Matic Inc's Gate operators conform to the most ridged Class One.**

# CONCRETE PAD FOR SW-300

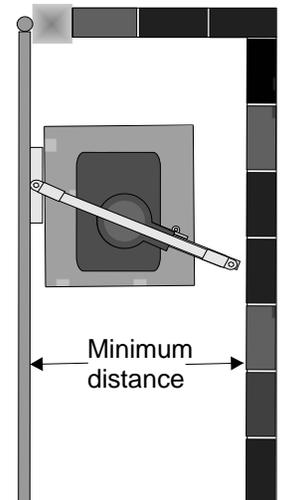


# OPERATOR AND ARM DIMENSIONS



## Dimensions Chart

Gate length	A	B	C	Minimum Distance
Less than 12"	36"	35"	14"	34"
13'-15'	42"	41"	14"	37"
16'-22"	48"	47"	14"	40"

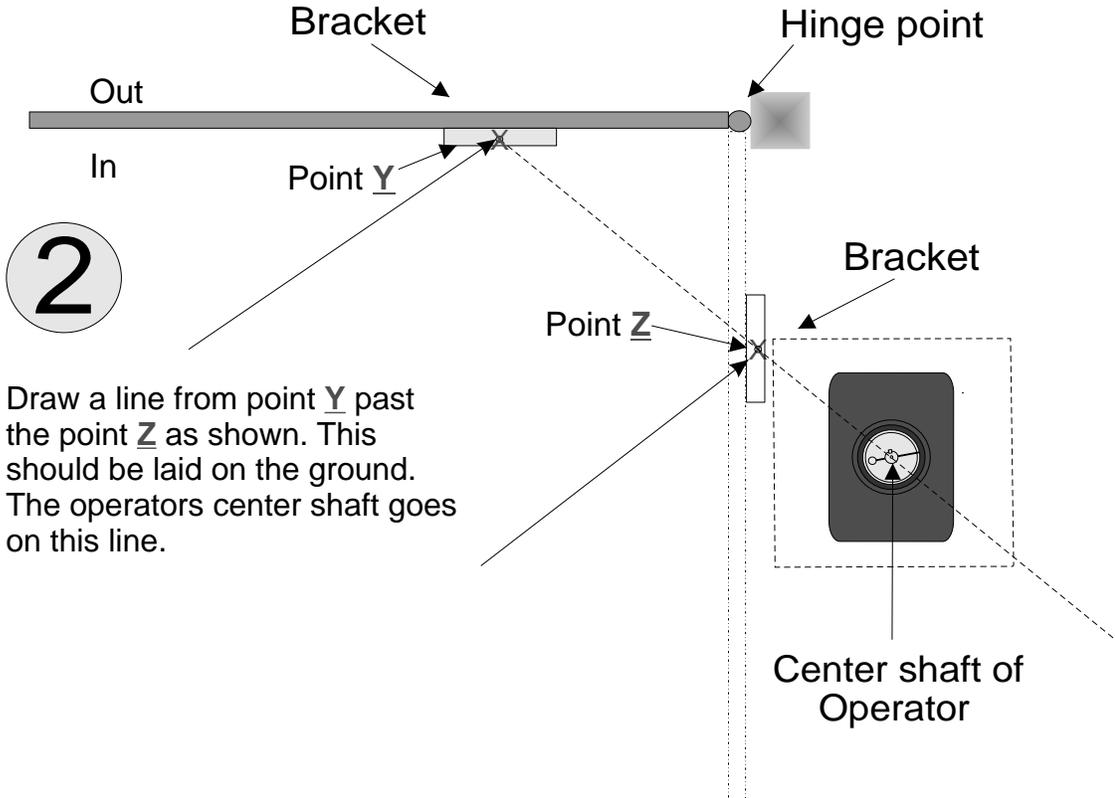
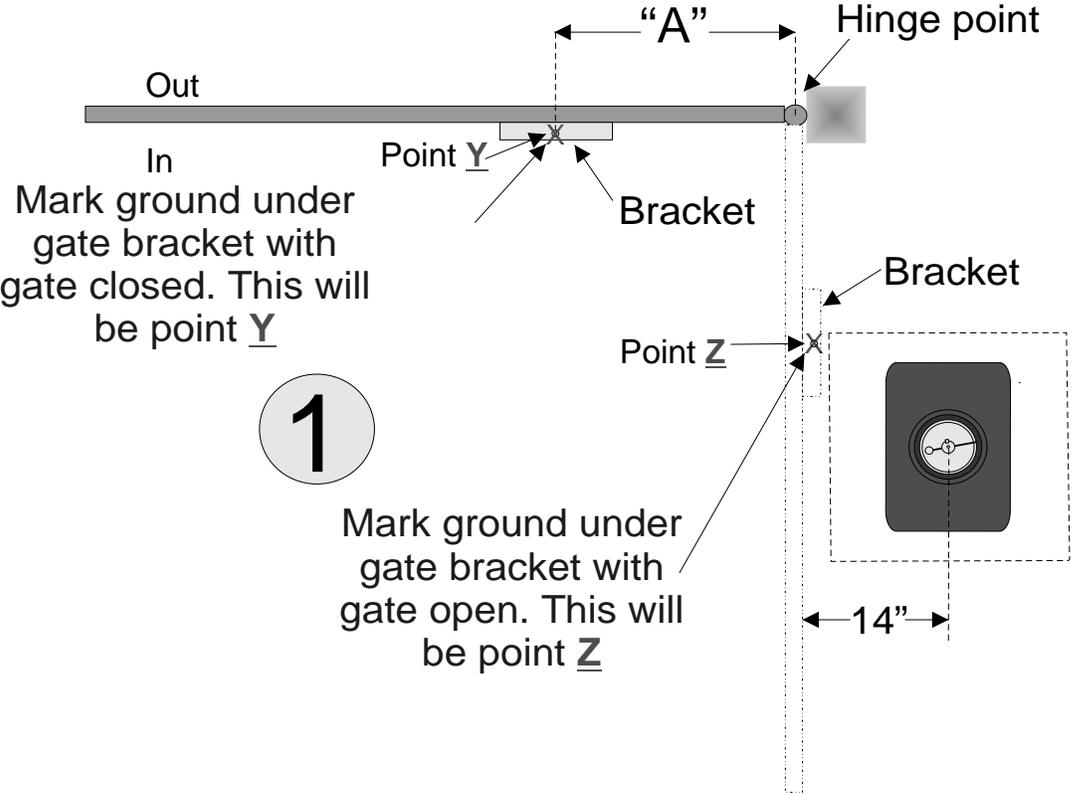


- A:** Is the distance between the gate bracket and the gate hinge point.
- B:** Is the distance between the gate hinge point and the edge of the concrete pad.
- C:** Is the distance from the gate in the open position to the center shaft of the operator.

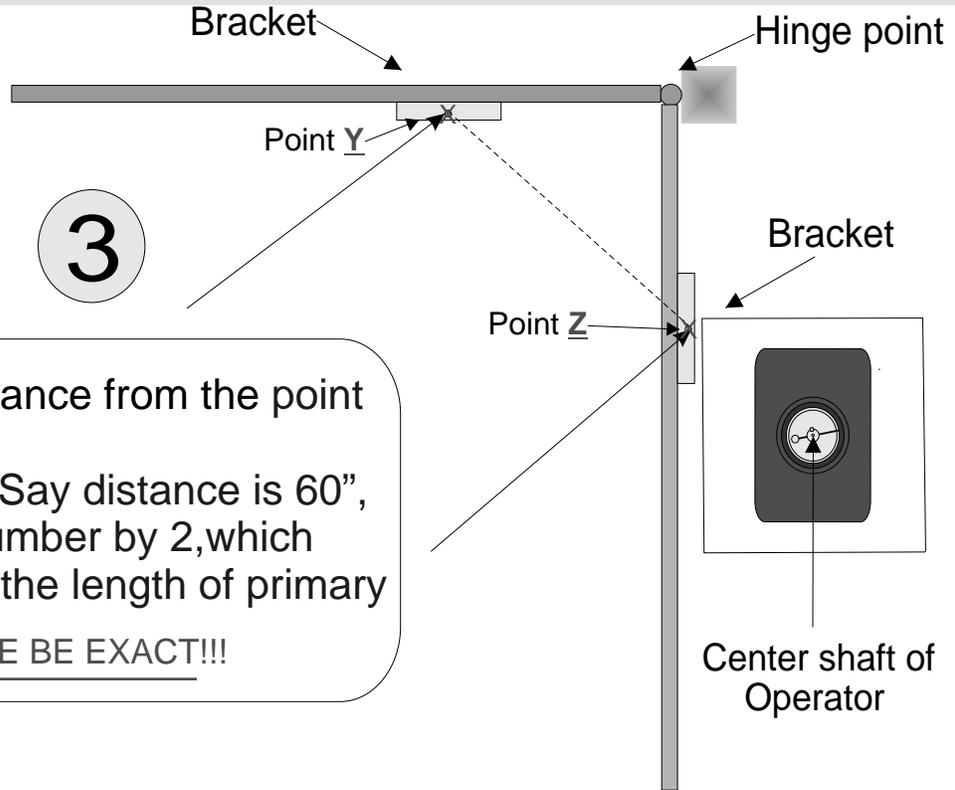
**Minimum distance:** Is the minimum distance required behind the open gate. If the distance between the open gate and the back wall is between 20" and 33" refer to compact installation.

**Note:** The 2" distance shown above is from the gate in the open position to the edge of the pad. If the gate must open more than 90 degrees, the pad needs to move back accordingly. The distance between the open gate and the pad needs to remain 2". The distance "C" also needs to move back accordingly if the opening is more than 90 degrees.

# OPERATOR AND ARM LAYOUT

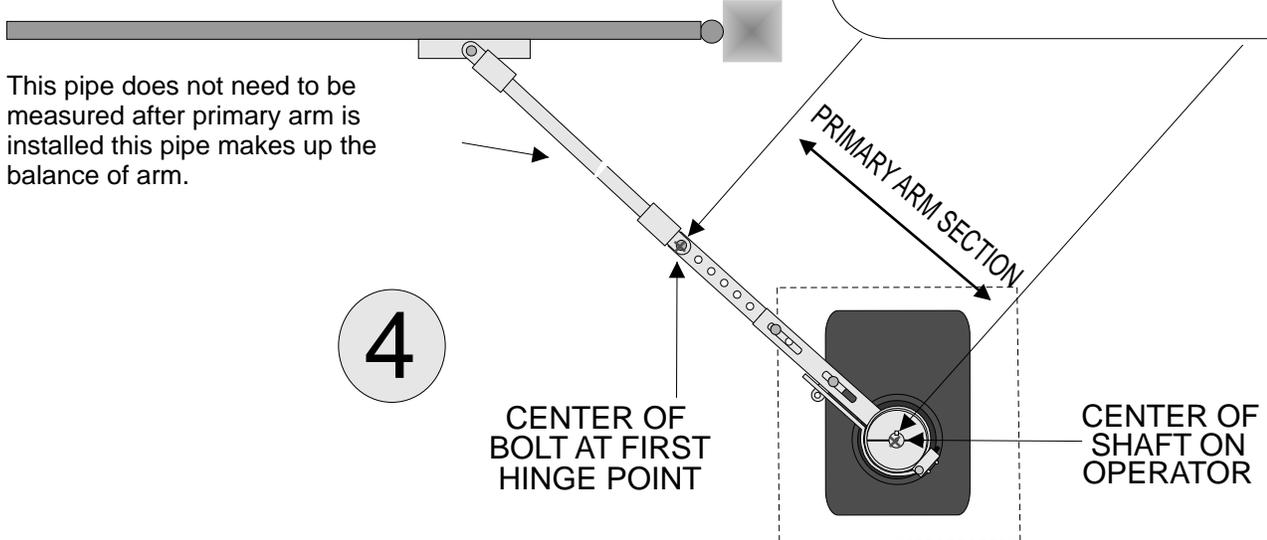


# ARM LAYOUT & OPERATOR PLACEMENT CONTINUED



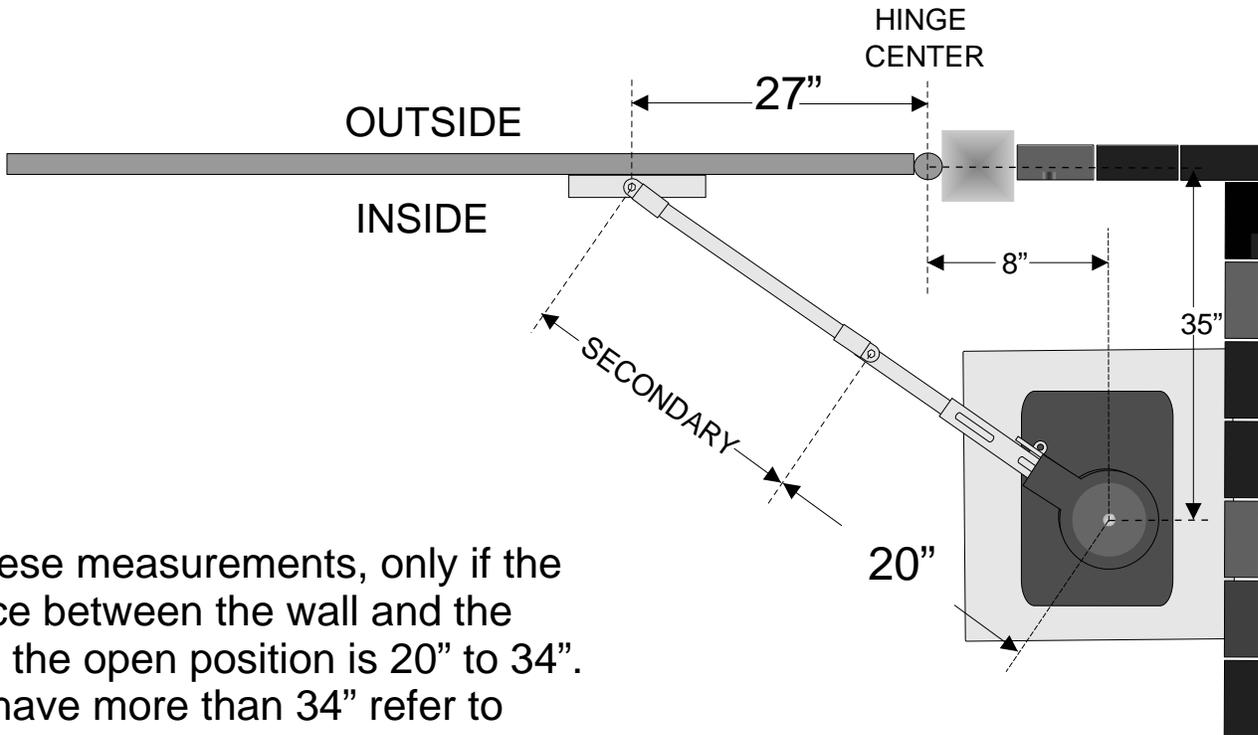
Measure distance from the point Y And point Z. Say distance is 60", divide this number by 2, which =30". This is the length of primary PLEASE BE EXACT!!!

This ARM section is half the distance between point Y and point Z as shown above. IT MUST BE EXACT!!!

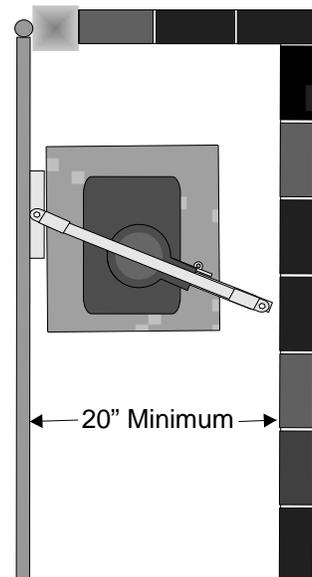


# SWINGER COMPACT INSTALLATION

To use this installation the gate must be 12' or less.



Use these measurements, only if the distance between the wall and the gate in the open position is 20\" to 34\". If you have more than 34\" refer to standard installation.



# TORQUE LIMITER AND ARM ADJUSTMENT

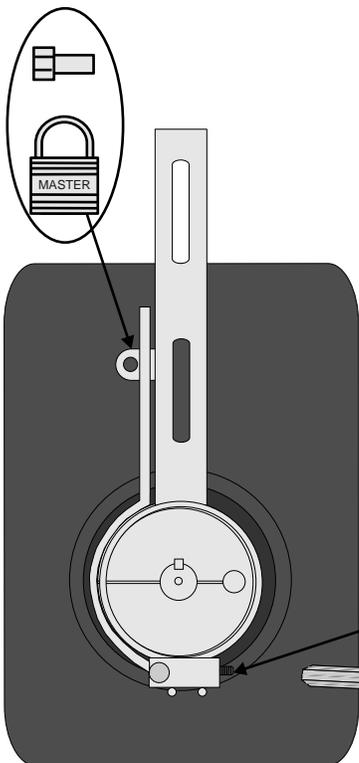
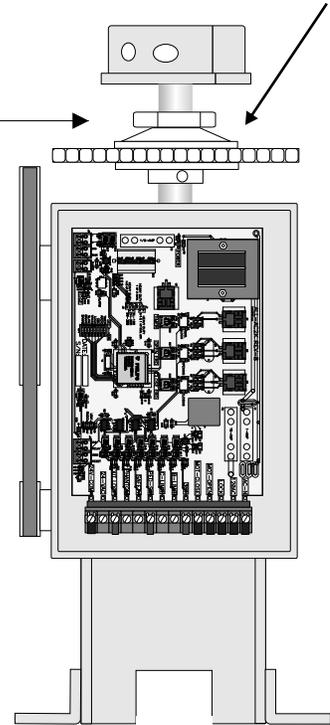
The torque limiter is shipped loose (not adjusted). You must use a 20" pipe wrench to adjust the large torque limiter nut on the operator as shown in the images below.

Tighten torque limiter nut until arm does not slip when the operator is running.

Also run gate and grab gate at mid cycle to make sure torque limiter will slip. This is an important adjustment, so please take your time and do it right.

Torque limiter adjusting nut.

20" Pipe wrench

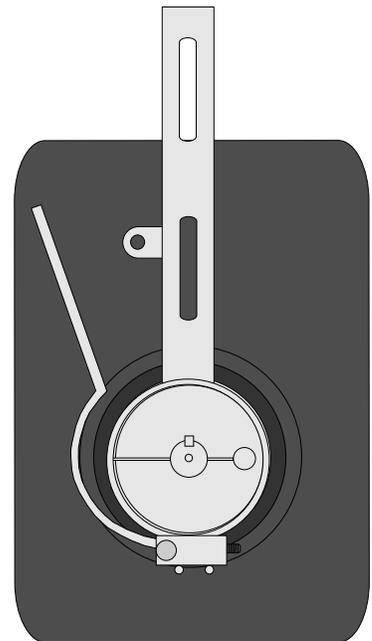


**ARM ADJUSTMENT:** Use a pad lock or a bolt to hold the arm lever in closed position. With the arm lever closed tighten the arm adjusting screw as tight as possible.

**ARM QUICK RELEASE:** To release the arm with the quick release, simply remove the bolt or padlock from the arm lever and open it. Opening the arm lever will allow you to manually open the gate.

Arm adjusting screw

Allen wrench



## GATE TRAVEL ADJUSTMENT

Locate limit switch.

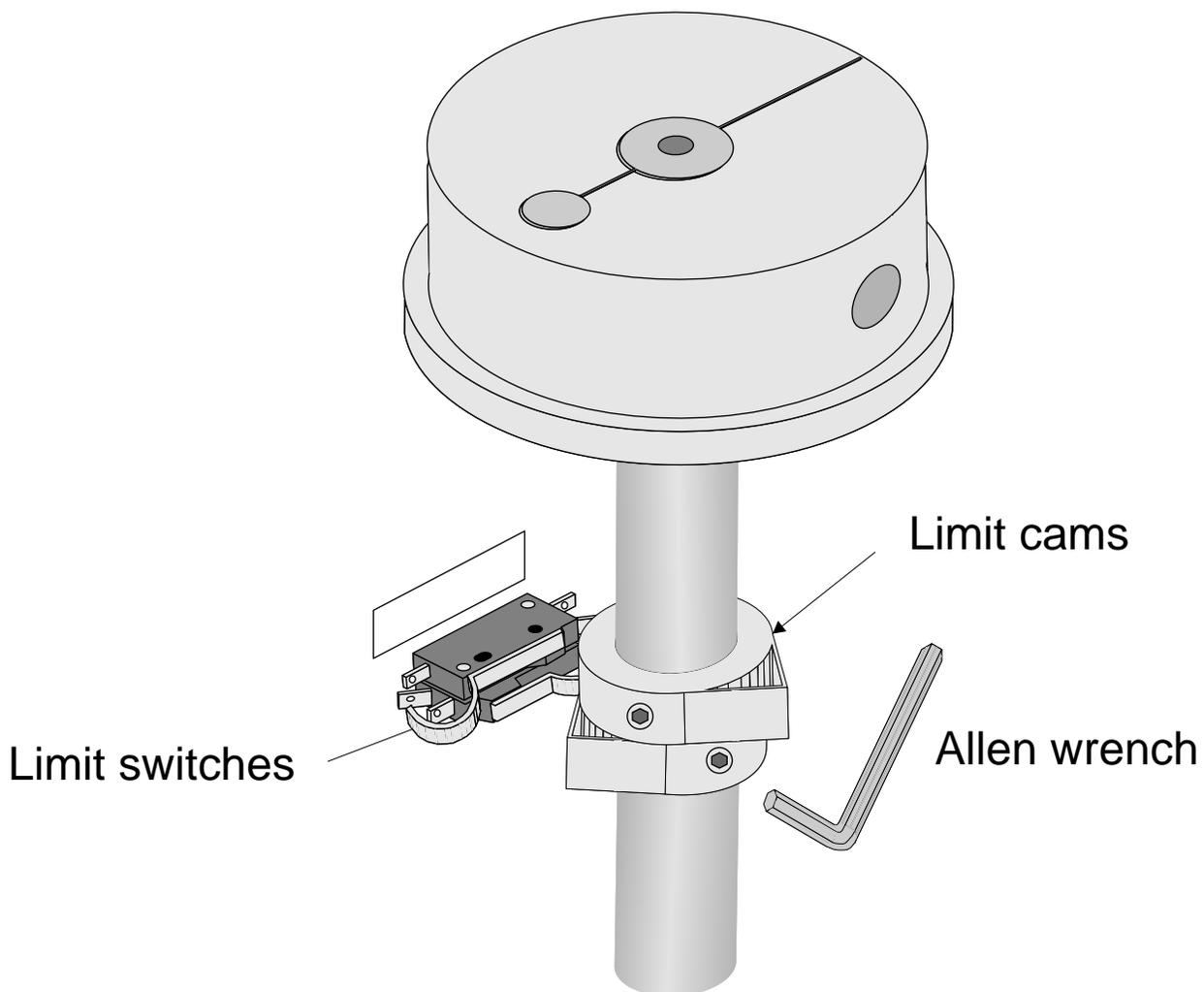
Step 1: Turn the power off on operator.

Step 2: Use an allen wrench to loosen up the limit cams. Turn the limit Cams to desired direction.

Step 3: tighten the allen screw.

Step 4: Turn the operator back on.

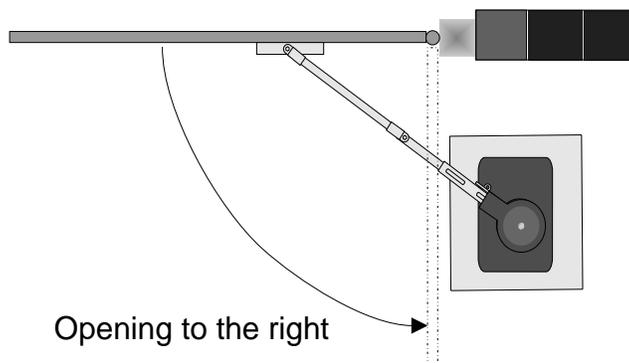
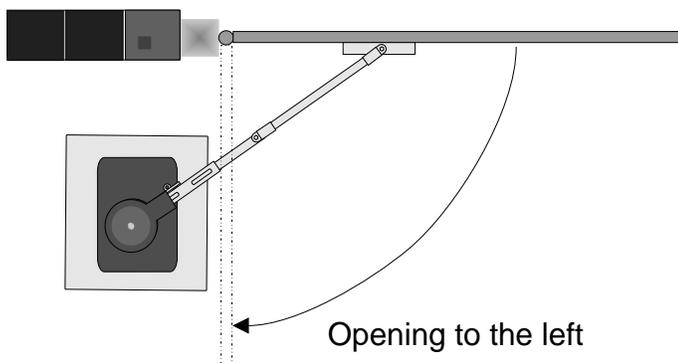
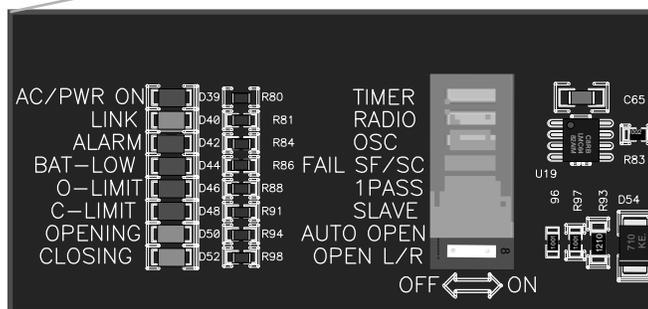
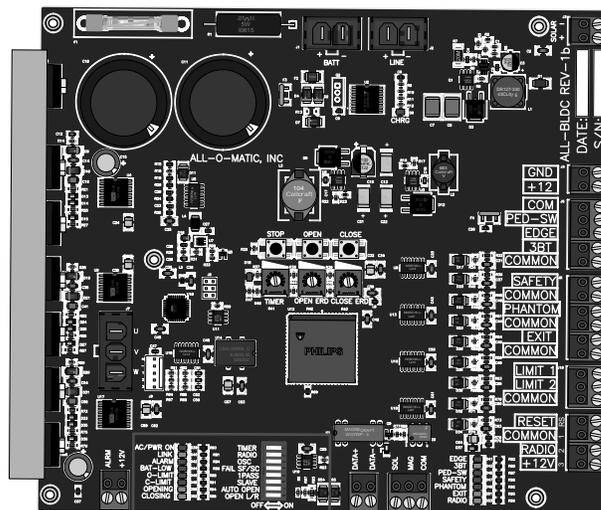
Step 5: Run gate operator. If more adjustment is needed, repeat the steps.



# OPENING DIRECTION SETTINGS

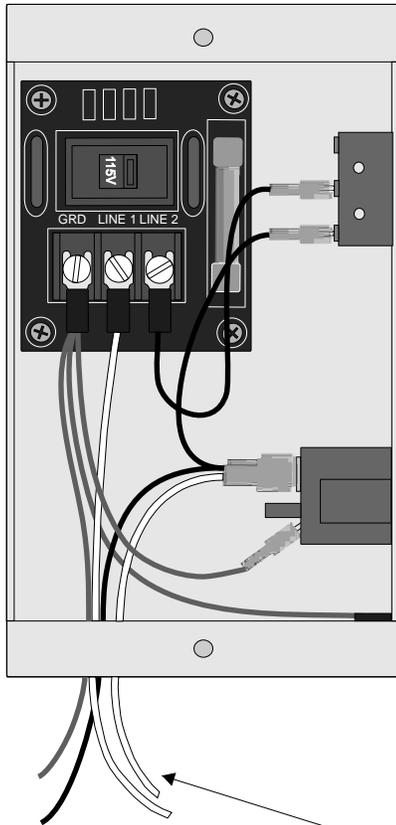
Use OPEN L/R dipswitch to change the opening direction on the operator. **OFF** for left hand opening, **ON** for right hand opening.

LED's will show opening or closing directions when gate is running.



# ELECTRICAL CONNECTION

OPERATORS **MUST** BE PROPERLY GROUNDED!



Power switch



**NOTE:** When applying 230V to operator make sure voltage switch is flipped to 230V position.

120 Volt  
Electrical  
Plug.

Power connection	115VAC	220VAC Single Phase
LINE 1 =	115V N	220V LINE 1
LINE 2 =	115V HOT	220V LINE 2

**GND** Connect to ground. Use a proper **ground rod** for a ground reference.

Use the shortest and thickest wire possible for ground.

For power, a minimum of a 15-Amp dedicated circuit breaker is needed.

**NOTE:** To use the 120VAC accessory outlet, connect white wire from the outlet to neutral. Only when using 120VAC as the power source.

For power wire enclosure use UL listed conduits.

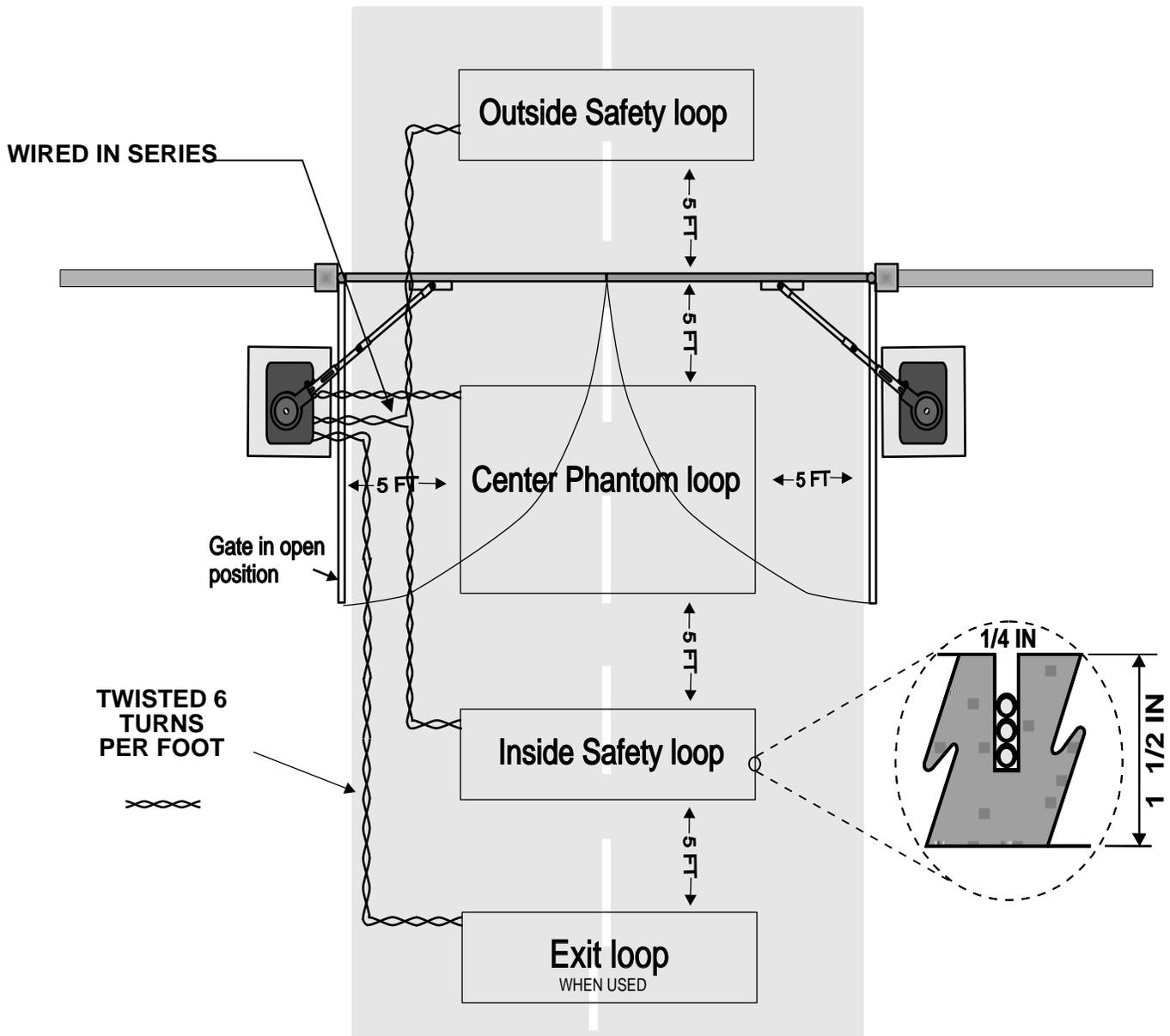
All gate operators **MUST** be properly grounded.

A proper ground in a gate operator installation minimizes or prevents damage from an electrical charge, such as a near lightning 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. **NEVER** use two wires for the ground.

Check with your City code for proper earth ground rod type and proper grounding procedures.

# SWINGER LOOP LAYOUT



This is a normal loop layout. Remember when connecting to an All-O-Matic circuit board you use the **normally closed contacts** from your safety loop detector and **normally open contacts** from the exit loop. You must twist your wires from your exit point of the saw cut all the way to the circuit board, no exceptions.

# GENERAL LOOP INSTALLATION GUIDELINES

The following loop installation guidelines are for installing typical driveway loops for access control applications (i.e. parking gates, sliding gates, swing gates etc...) Always consult with loop detector manufacturers for specific equipment guidelines. This will confirm that the proper configuration and installation techniques are applied for your application.

Useful information about inductive loops:

- A. The typical sensing height is 2/3 of the shortest leg of loop (in feet)  
Therefore a 4' x 8' loop typically has a detection height of 2.6'.
- B. The inductance of a conventional four-side loop can be estimated using the formula:

$$L = P \times (T^2 + T) / 4$$

Where L = Loop Inductance in microHenries

P = Loop Perimeter in feet

T = Number of turns of wire in saw slot

Therefore a 4' x 8' loop with 3 turns would be:

$$L = (4 + 8 + 4 + 8) \times (3^2 + 3) / 4$$

$$L = 24 \times (9 + 3) / 4$$

$$L = 24 \times 12 / 4$$

$$L = 24 \times 3$$

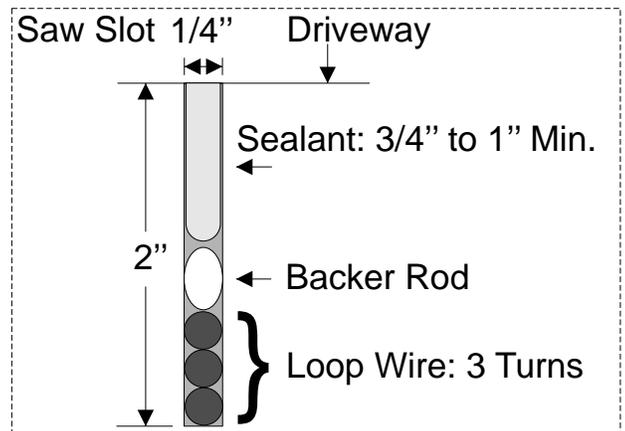
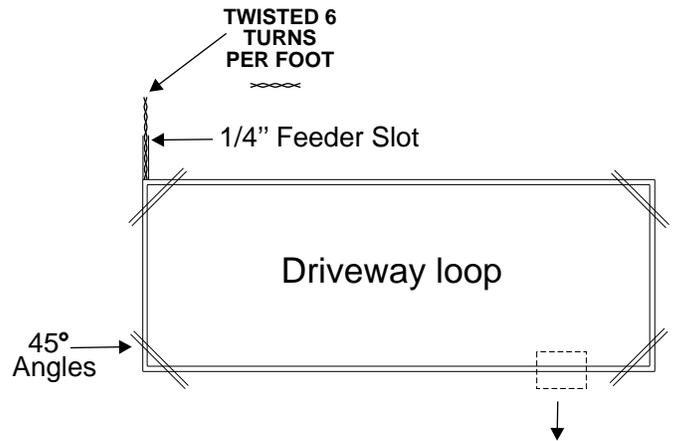
$$L = 72 \text{ microHenries}$$

Suggested guidelines for loop installation:

Loop wires should be twisted 6 turns per foot, and twisted from saw slot to the detector. If possible start twisting the wires from the edge of the loop.

All 90 degree corners should be chamfered so that the course of the wire does not change direction sharply but rather at shallower angles of 45 degrees or less. Core drilling of the corners achieves the same effect but can still lead to failure due to sharp edges remaining in the corner area.

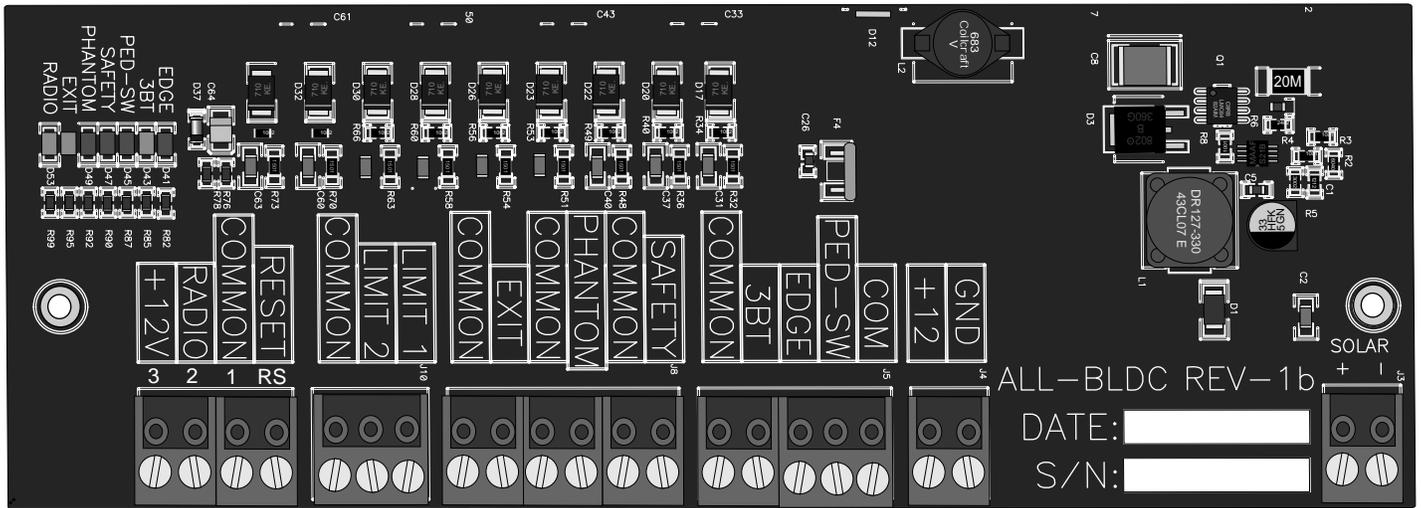
Loop Perimeter	# of Turns
6' - 12'	6
13' - 20'	5
21' - 60'	4
61' - 240"	3
241 & Up	2



# ACCESSORY CONNECTIONS

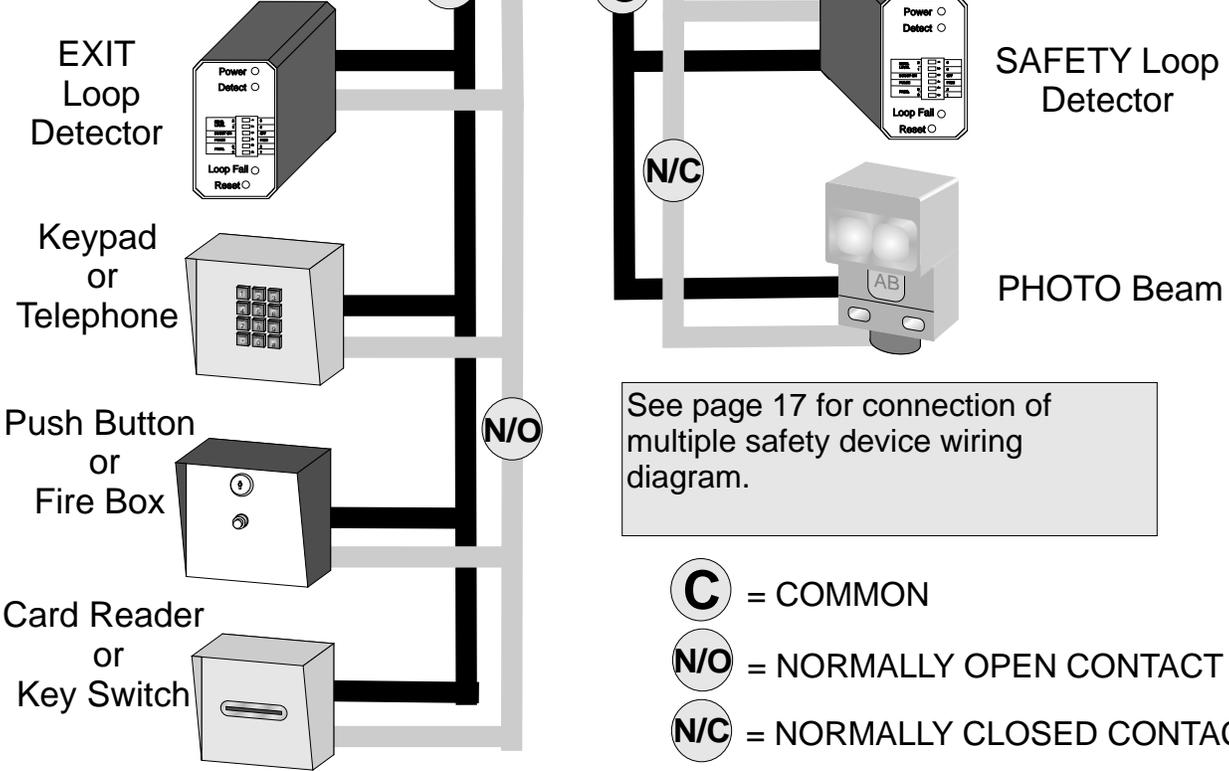
The circuit board 12-VDC output provides up to 500 mAmps of power for accessories. More than two or three accessories will require a separate power supply.

**NOTE: 12VDC Accessories only.**



See page 18 for plugin detector installation.

Remove wire jumper from SAFETY when a safety device is installed.



See page 17 for connection of multiple safety device wiring diagram.

- C** = COMMON
- N/O** = NORMALLY OPEN CONTACT
- N/C** = NORMALLY CLOSED CONTACT

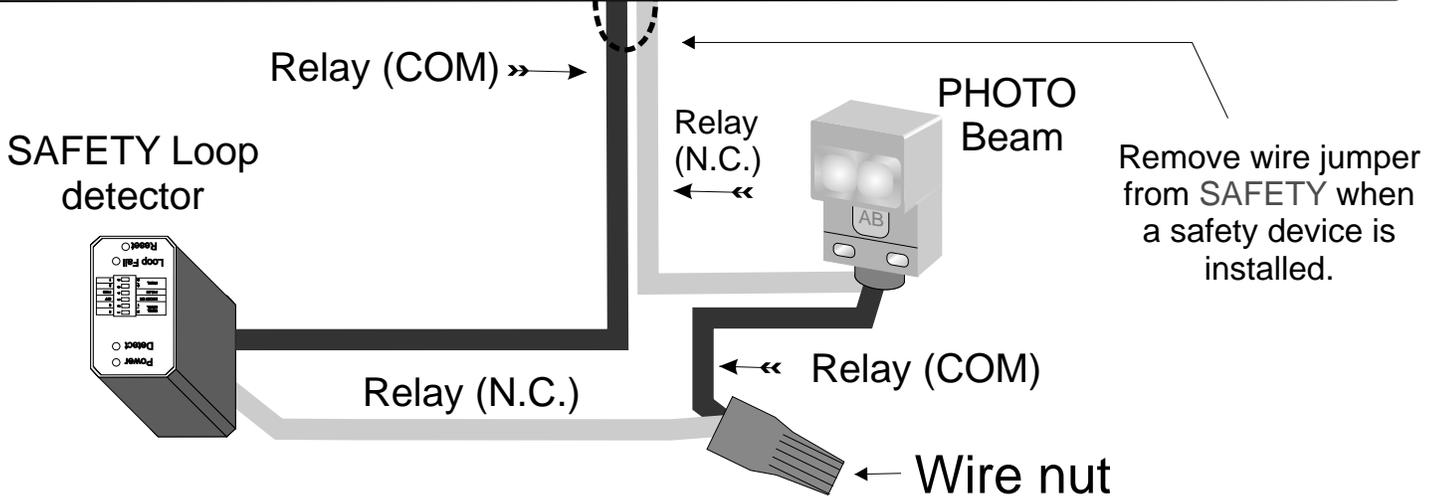
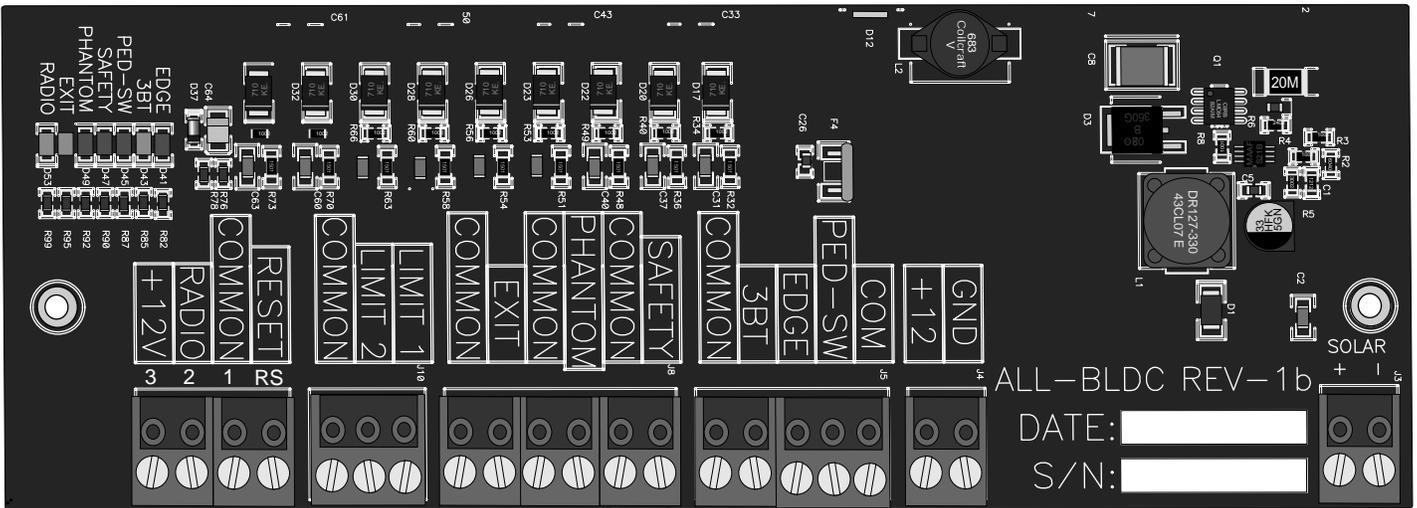
# MULTIPLE SAFETY DEVICES CONNECTIONS

Multiple SAFETY devices installed together must be connected "in series". Locate the normally closed (N.C.) dry contact from each accessory relay. Before installing the accessory devices, remove the wire jumper from the SAFETY position on the control board.

## Safety wire connections

From Accessory #1 To Connecting pin		From Accessory #2 To Connecting pin	
Relay Com	To COMMON	Relay N.C.	To SAFETY

From Accessory #1 to Accessory # 2	
Relay N.C.	To Relay COM

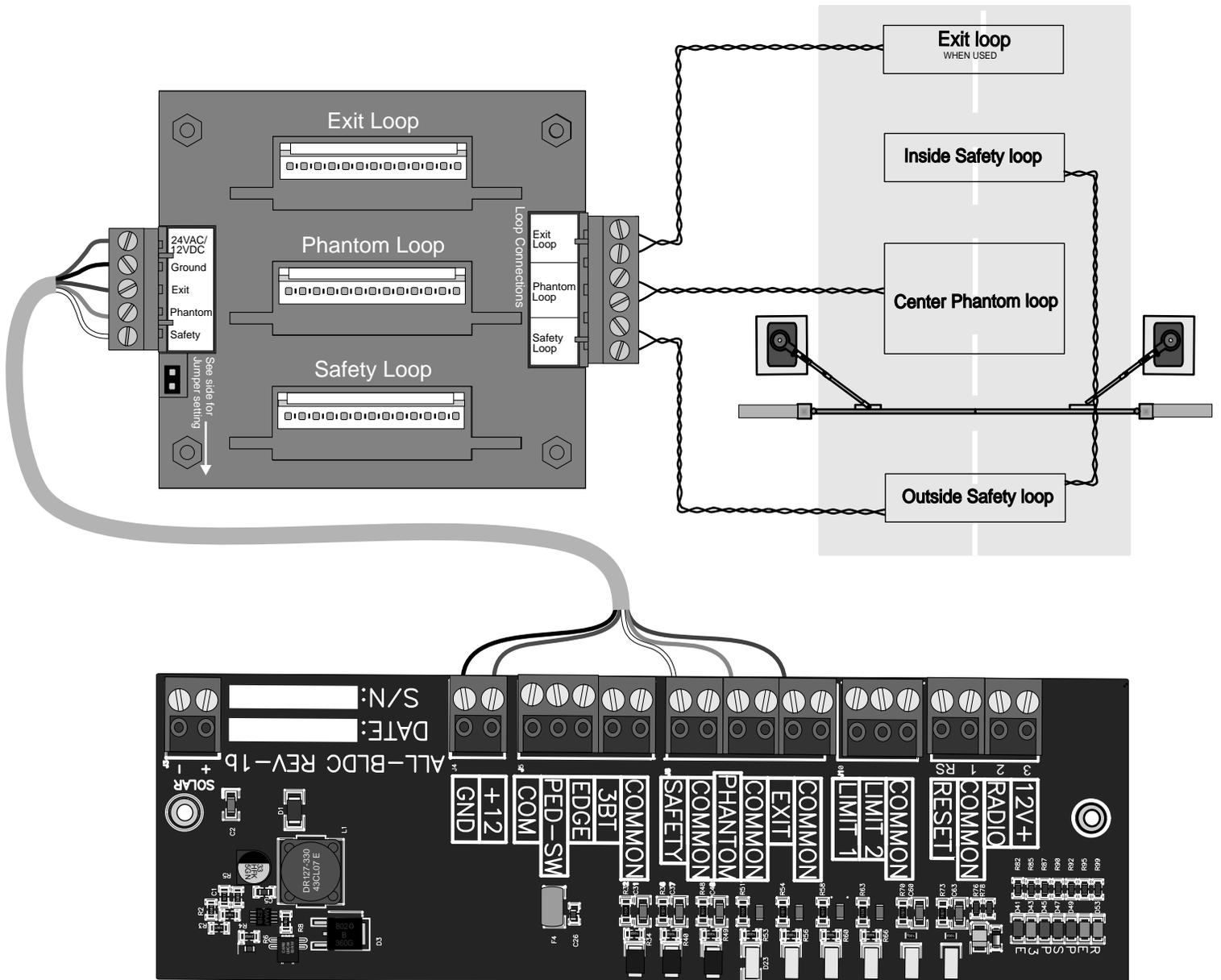


This diagram is for the relay wires of the safety devices, two wires to the board connections (one from each device) and two wires to the orange wire nut.

# LPR-1 LOOP RACK INATALLATION

This is a typical loop configuration for a gated driveway. Remember when connecting to an All-O-Matic circuit board the safety (reverse) uses **normally closed contacts** from the loop detector, the wire jumper from the safety connector needs to be removed when a safety loop is installed.

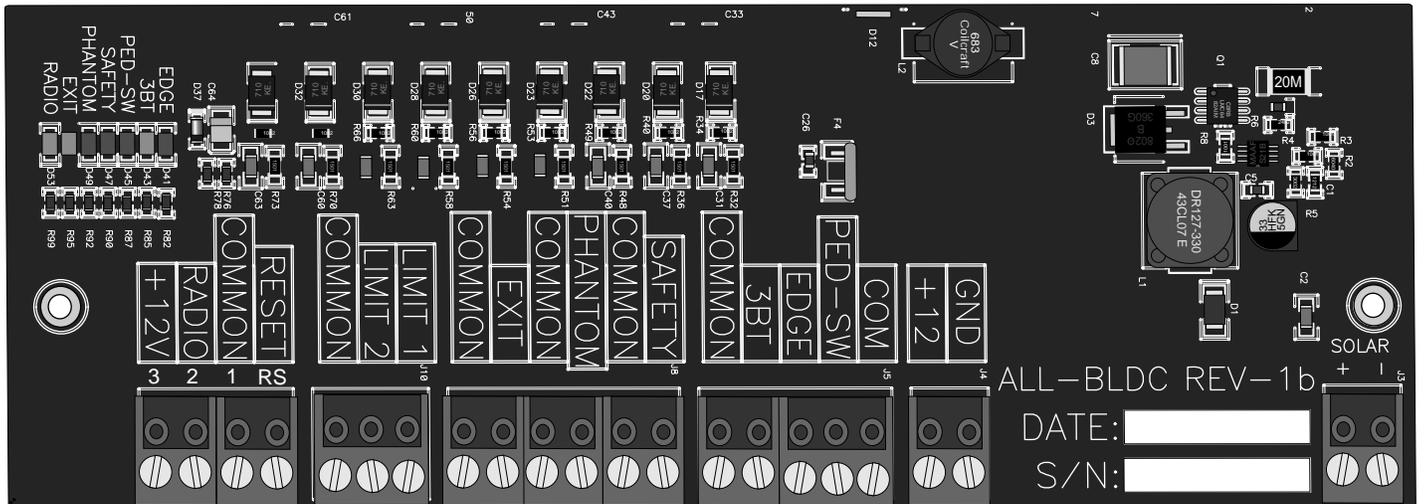
You must twist the wires from the exit point of the saw cut all the way to the loop detectors, no exceptions.



## Compatible Detectors

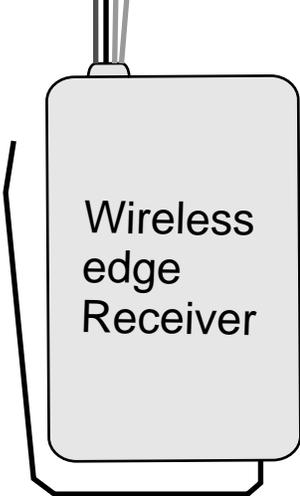
Brand	Model No.	Jumper setting
Reno A&E	H2	<input type="checkbox"/> <input checked="" type="checkbox"/> OFF
EDI	LMA-1500-LP	<input type="checkbox"/> <input checked="" type="checkbox"/> OFF
Diablo Controls	DSP-40S	<input checked="" type="checkbox"/> <input type="checkbox"/> ON

# LEADING EDGE CONNECTION



RED wire to 12VDC  
 BLACK wire to COMMON

LEADING EDGE SENSOR

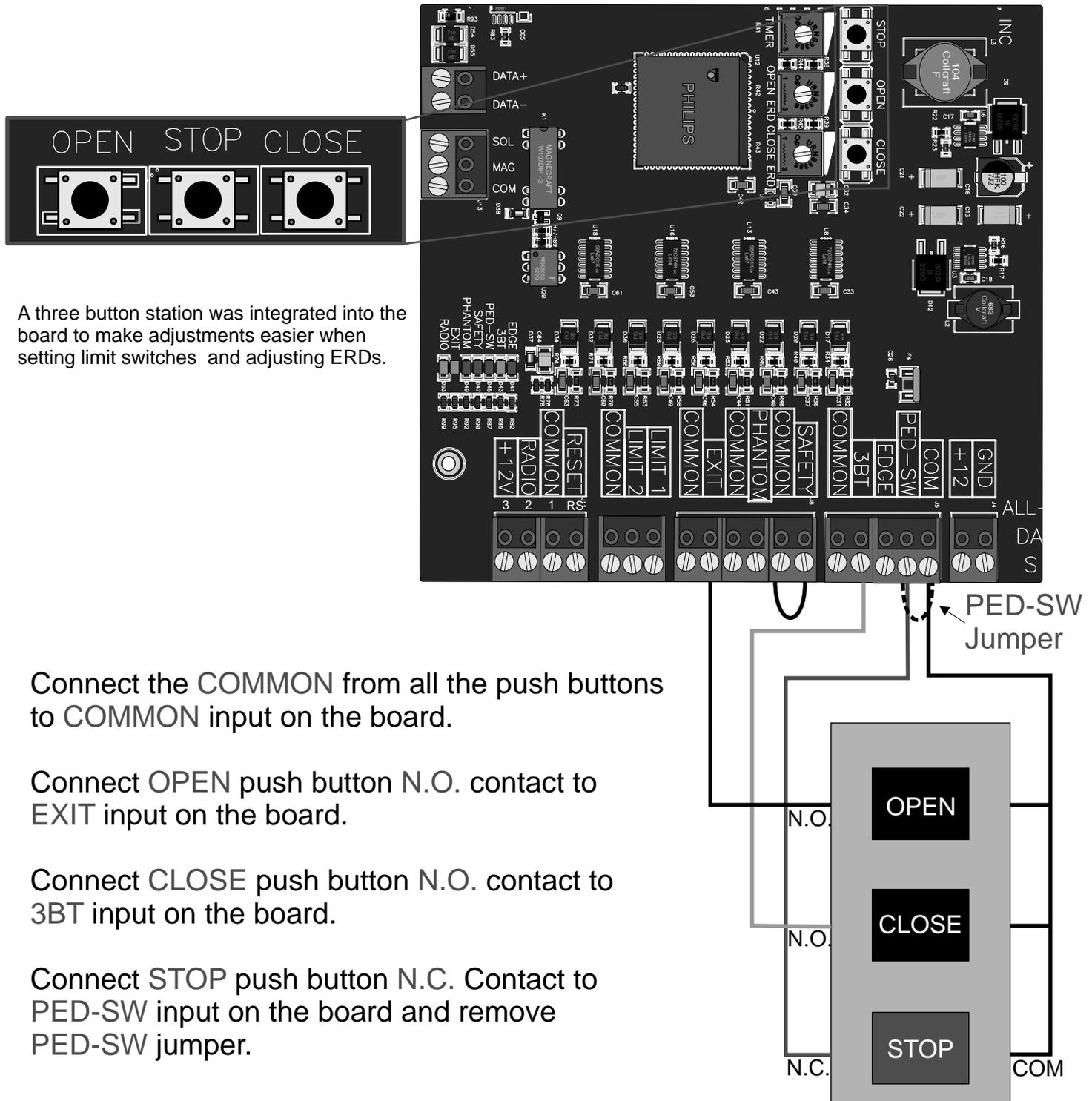


Connect one of the wires from leading edge and/or one of the grey wires from a wireless edge receiver to **COMMON** connector on control board.

Connect the other wire from leading edge and/or the other wire from a wireless edge receiver to **EDGE** connector on control board.

# THREE BUTTON STATION SYSTEM

See push button connections below.



A three button station was integrated into the board to make adjustments easier when setting limit switches and adjusting ERDs.

Connect the COMMON from all the push buttons to COMMON input on the board.

Connect OPEN push button N.O. contact to EXIT input on the board.

Connect CLOSE push button N.O. contact to 3BT input on the board.

Connect STOP push button N.C. Contact to PED-SW input on the board and remove PED-SW jumper.

# MASTER/SLAVE CONNECTION

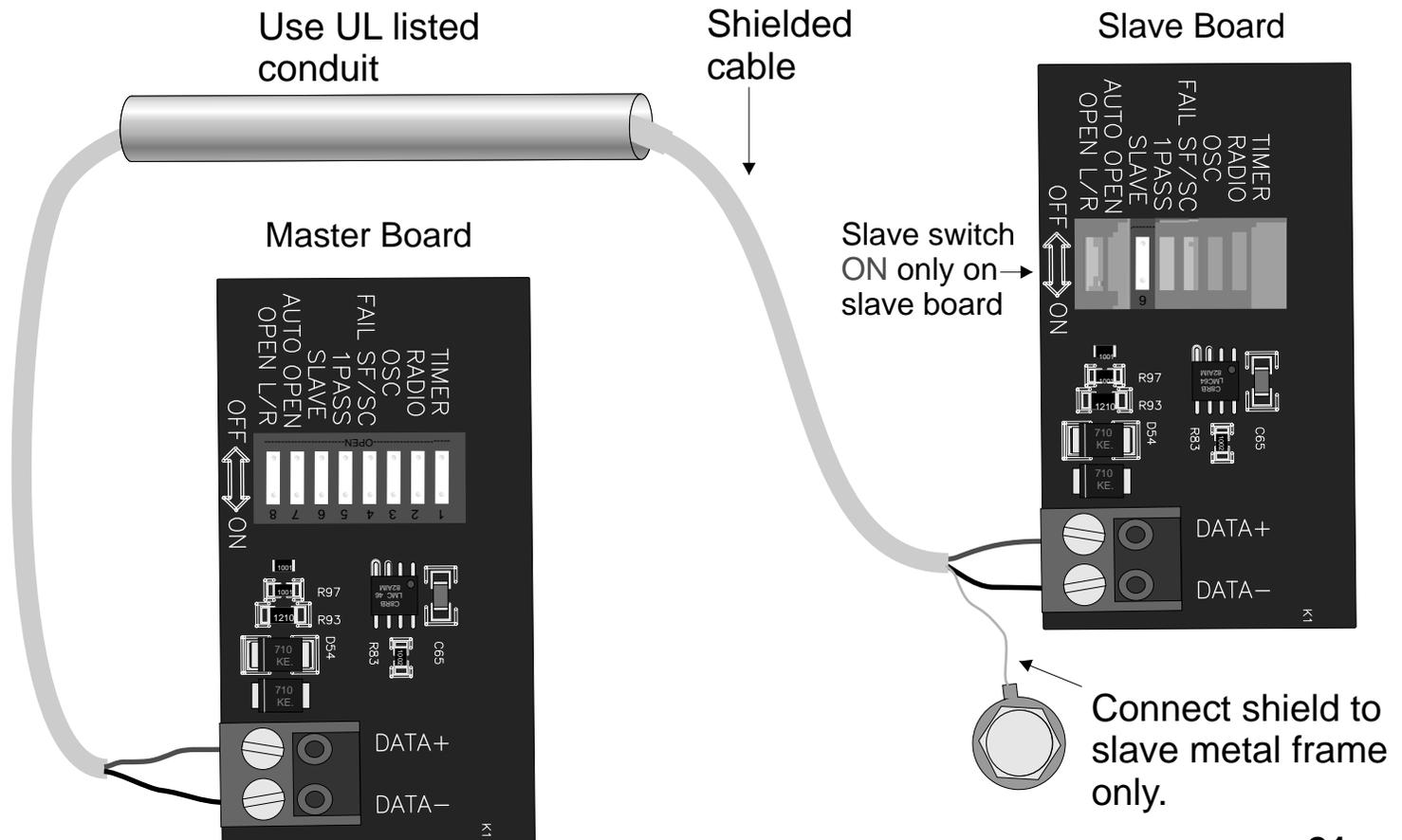
Before connecting master/slave gate operators together, test and adjust the limit switches and the ERDs for each operator as “stand alone” machines.

All accessories must be installed on the master board, no exception.

See page 20 for dip switch settings.

Use a two wire **shielded cable** and run it through a UL listed conduit for master/slave connection. Follow the wiring diagram as shown below.

<u>Master Board</u>	<u>Slave Board</u>
+.....Positive to Positive.....+	
-.....Negative to Negative.....-	



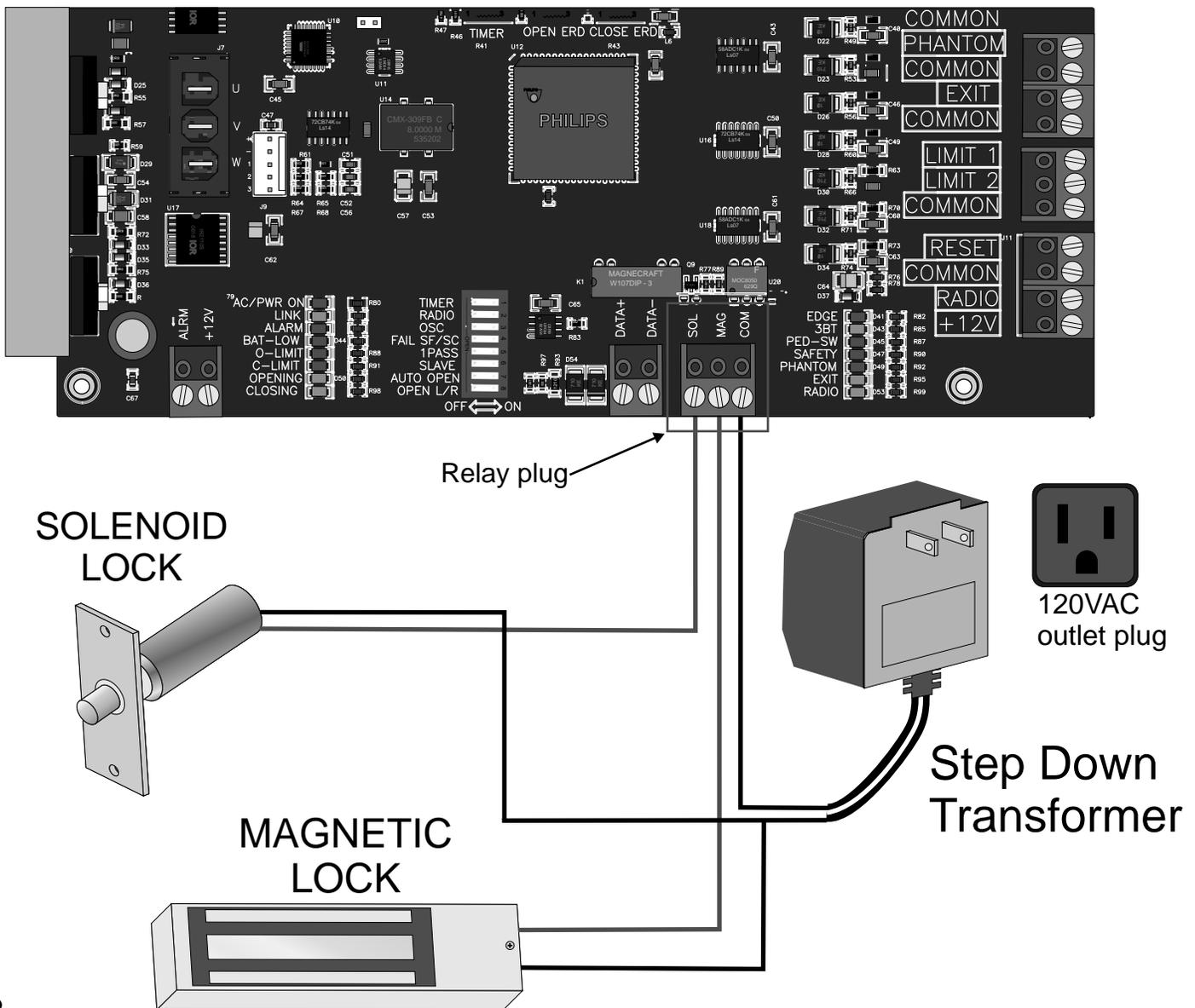
# MAGNETIC/SOLENOID LOCK CONNECTIONS

Magnetic lock installation requires a step down transformer with appropriate voltage for the specific lock accessory. Operator will provide a 120VAC outlet for the step down transformer.

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

**For Magnetic lock:** Connect one wire from transformer directly to one wire of the magnetic lock, the other wire from transformer will be connected to the relay plug COM input and the MAG relay output connects to the other wire of the magnetic lock. See illustration below.

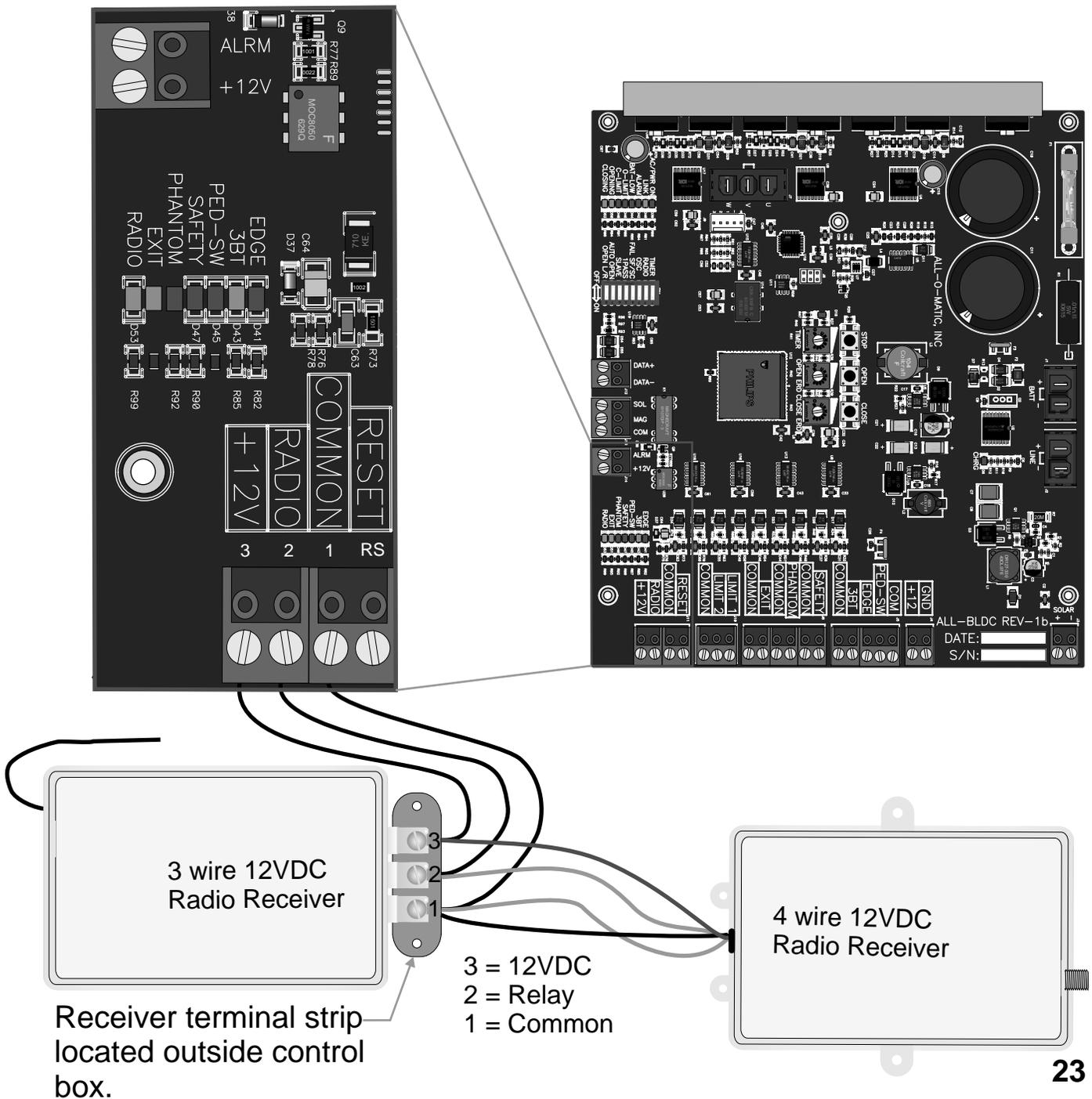
**For Solenoid lock:** Connect one wire from transformer directly to one wire of the solenoid lock, connect the other wire from transformer to the relay plug COM input and the SOL relay output connects to the other wire of the solenoid lock. See illustration below.



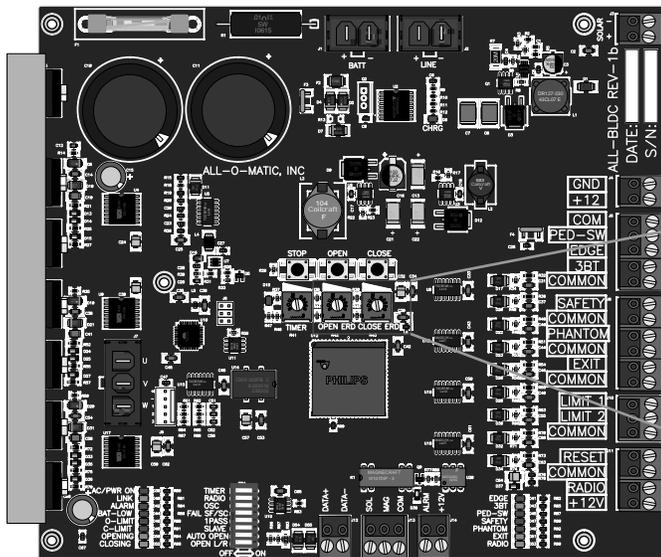
# RADIO RECEIVER CONNECTIONS

**3 wire receiver:** mounts on receiver strip outside control box as shown below.

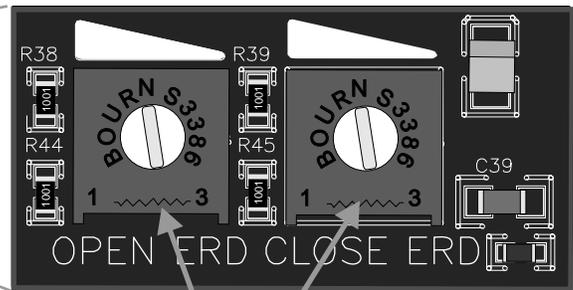
**4 wire receiver:** connect the two relay wires to 1 & 2 terminals. Black negative wire to terminal 1 and Red positive wire to terminal 3 on receiver strip outside control box as shown below.



# OPEN AND CLOSE ELECTRONIC REVERSING SENSOR(ERDs) ADJUSTMENT



Open and Close ERD  
SENSITIVITY  
MAX MIN MAX MIN



ERD'S must be adjusted by qualified technician.

The gate operator ERDs must be adjusted so that the gate provides regular, reliable and safe cycles.

ERD must be checked every six months.



Counter clockwise maximum sensitivity



Clockwise minimum sensitivity

When gate stops and reverses by itself, the ERD is too sensitive.

The gate must stop and reverse when it hits an obstruction or the ERD is not sensitive enough.

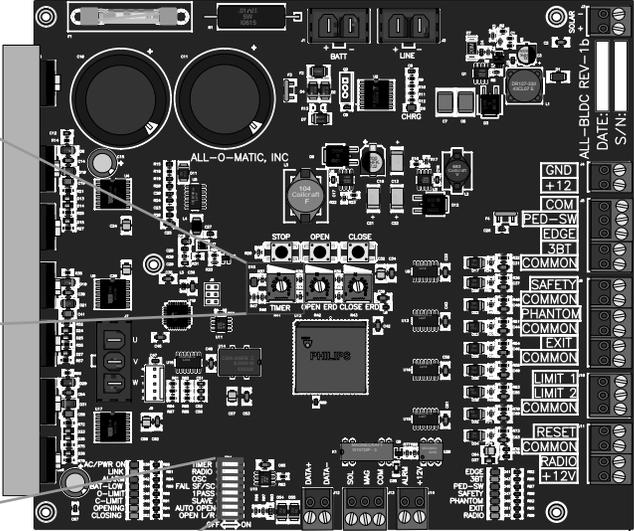
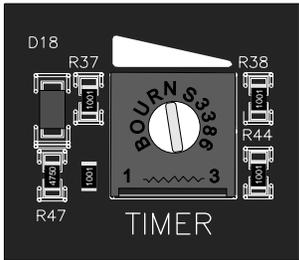
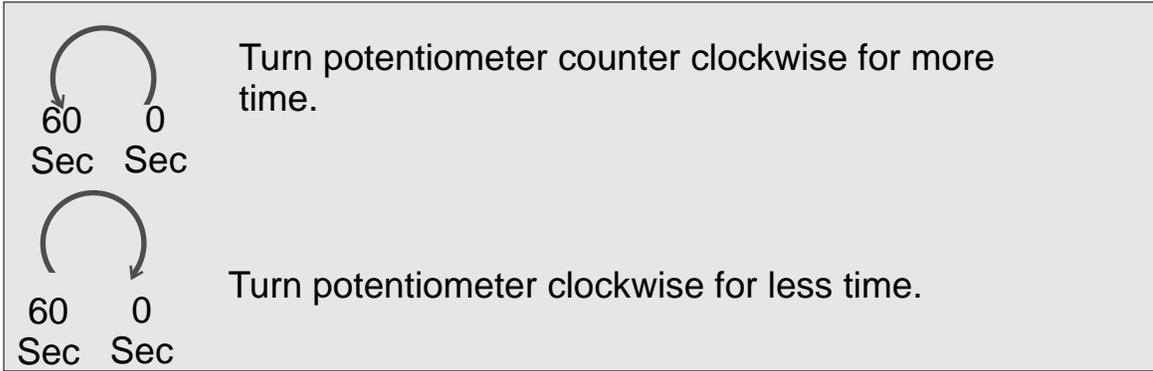
# TIMER ADJUSTMENT

TIMER ON: Timer to close, can be set from 1 to 60 seconds.

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

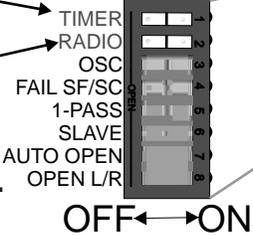
TO OVERRIDE THE TIMER: Turn the RADIO switch to the "ON" position. This will allow the radio receiver to close the gate before the timer.

## TIMER ADJUSTMENT

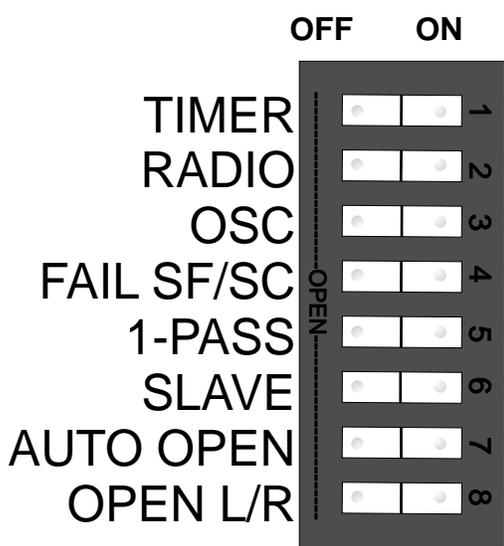


TIMER "ON" to activate the timer

RADIO "ON" = Allows the transmitter to close the gate before the timer.



# DIP SWITCH FUNCTIONS



## TIMER

**TIMER** switch "ON" activates the TIMER. See page 25 for details

## RADIO

**RADIO** switch "ON" allows the radio receiver to override the timer. See page 25 for details.

## OSC

**OSC** switch "ON" allows the radio receiver to stop and reverse the gate in any direction. During a cycle the first signal stops gate, a second signal reverses gate.

## FAIL SF/SC

This is to set the operator as fail-safe or fail secure. **ON** for **Fail-safe**: on power failure, board will monitor battery voltage to make sure gate opens before battery drains out completely. **OFF** for **Fail-secure**: on power failure gate will run until battery is low and either stay open or close depending what position it is when battery is low.

## 1-PASS

This is a true one pass, anti-tailgating feature. This feature may only be used with safety loops. With this switch in the "ON" position, the gate will open until one car passes the safety loops then it will stop and close. If a second car pulls on the loop the gate will stop the car must then back off the loop before the gate will close.

## SLAVE

This feature is used on master/slave setups. Set slave switch "ON" on slave machine, all other switches "OFF". Set slave switch to the "OFF" position on master machine. Set other function switches on master machine as desired. See page 21 for more details on master/slave connections and settings.

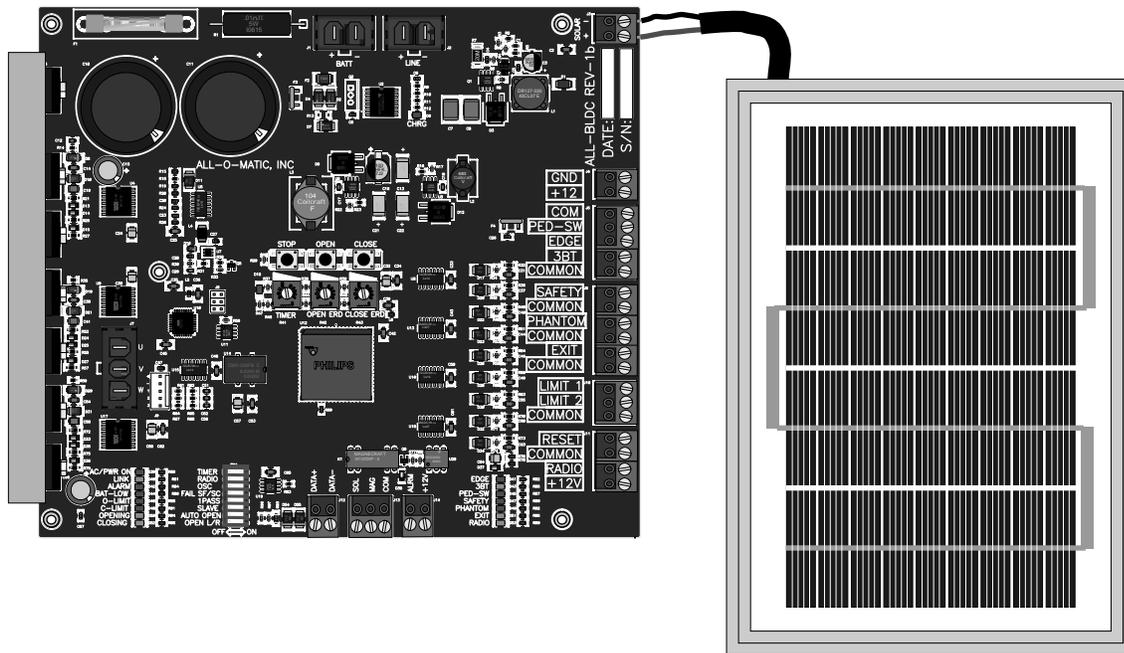
## AUTO OPEN

This feature is to automatic open the gate on power interruption. It is a very particular feature used in areas where the fire department requires the gate to open automatically after a power outage. Set this dip switch "ON" when this feature is desired.

## OPEN L/R

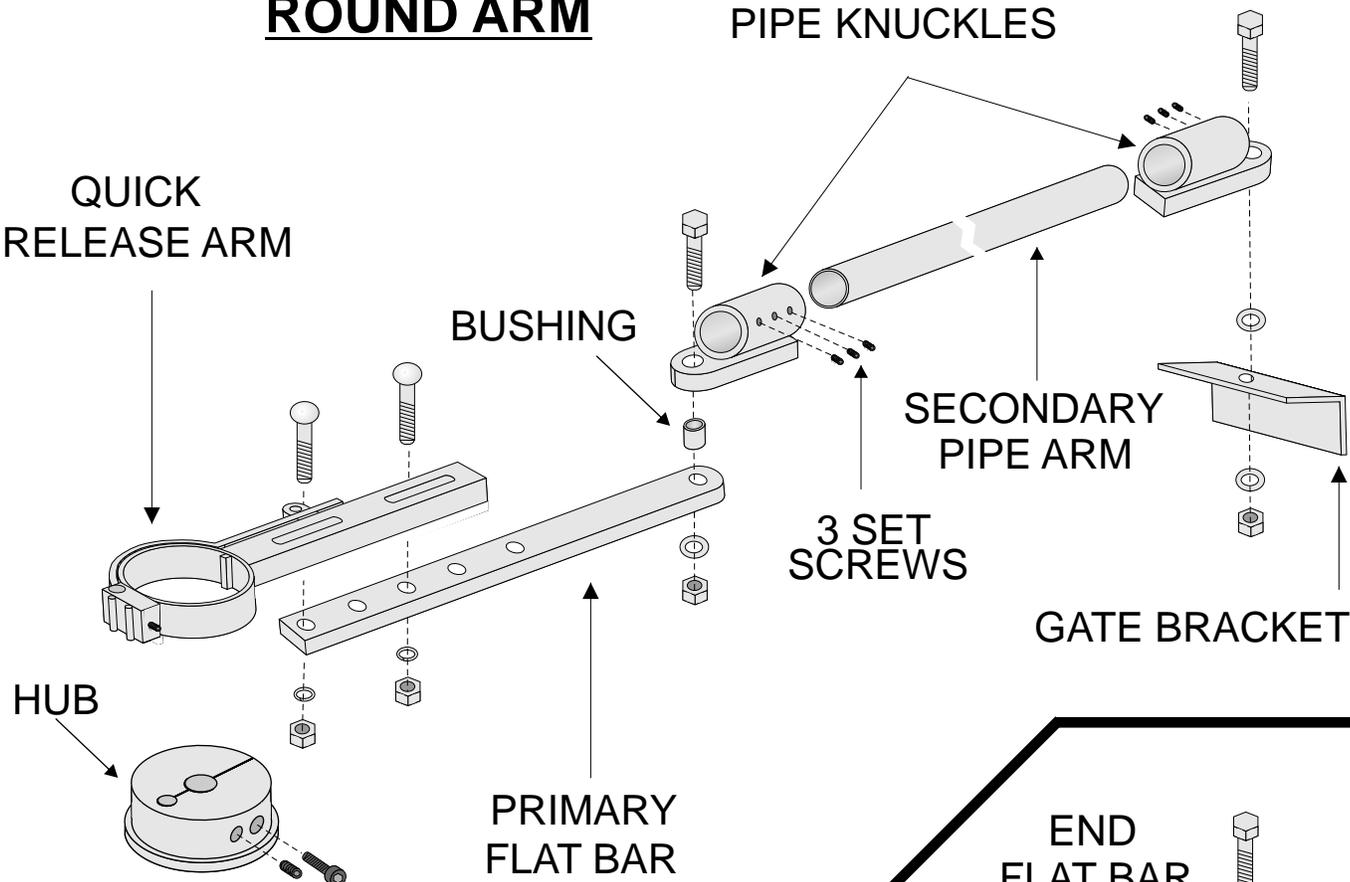
This feature is to set the direction the operator will open. See page 12 for details.

# SOLAR PANEL CONNECTION

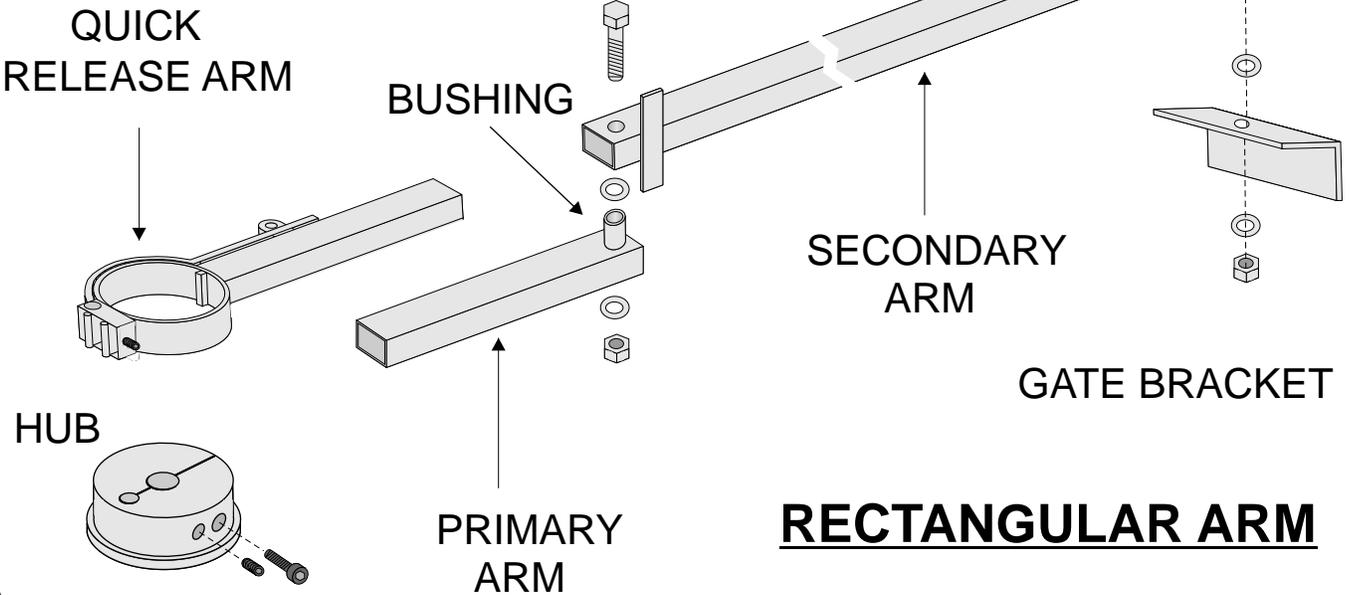


# SWINGER ARM PARTS

## ROUND ARM



## RECTANGULAR ARM



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