



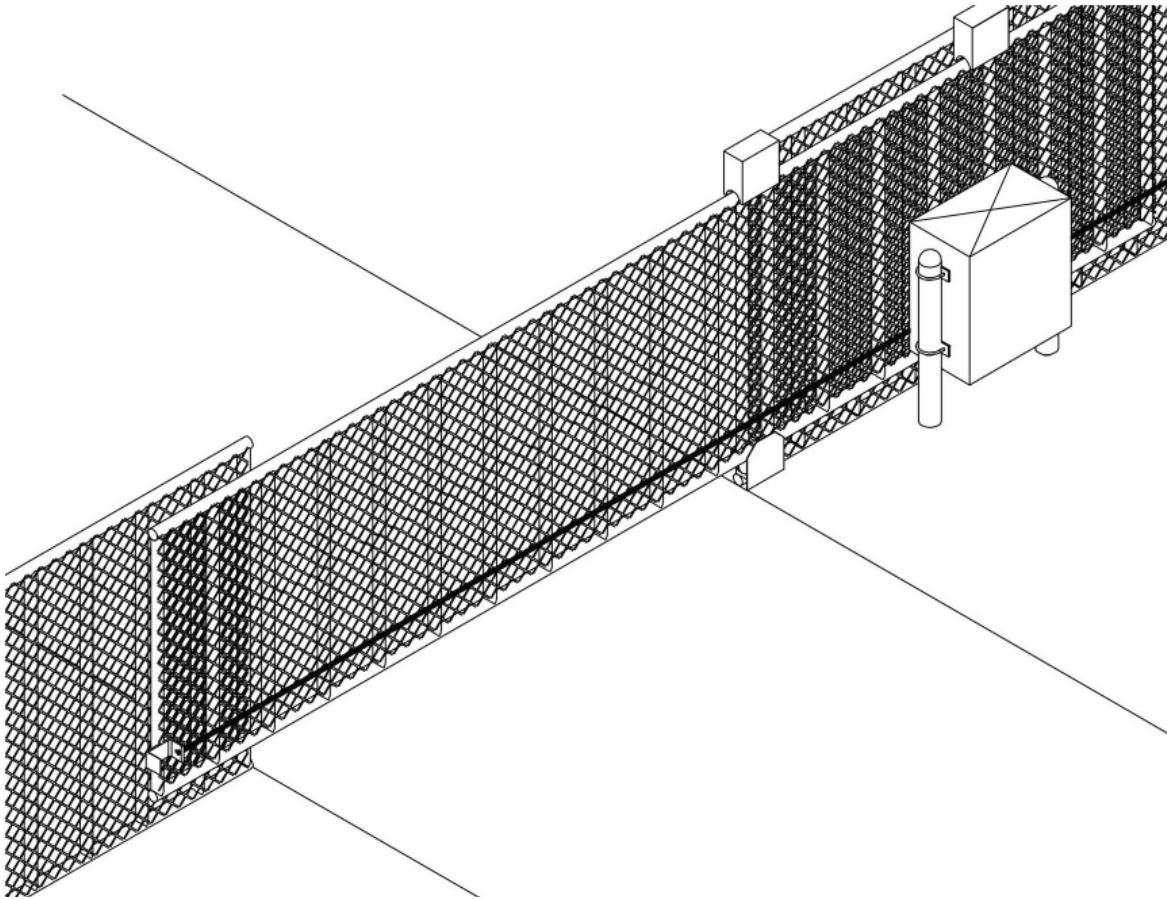
## **OHIO TURNPIKE AND INFRASTRUCTURE COMMISSION**

### **TOLL COLLECTION SYSTEM REQUEST FOR PROPOSALS**

#### **APPENDIX AP – BACK/REMOTE GATE INFORMATION**

# HSLG

## INSTALLATION GUIDE



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**UL325 COMPLIANCE REQUIRES THE USE OF CONTACT EDGES  
OR PHOTOELECTRIC CONTROLS ON ALL AUTOMATIC OR  
REMOTELY-CONTROLLED GATE OPERATORS.**

# HSLG OPERATOR INSTALLATION GUIDE

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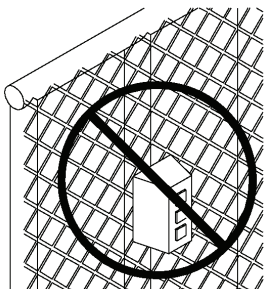
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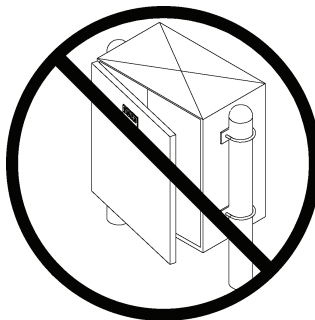
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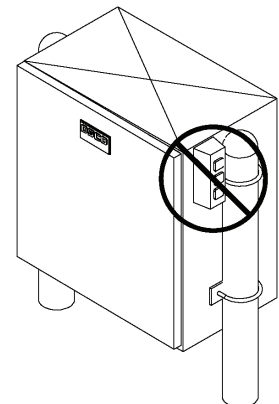
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**CAUTION!**  
DO NOT INSTALL  
CONTROLS ON A  
GATE OR FENCE  
LINE



**CAUTION!**  
ONLY QUALIFIED SERVICE  
TECHNICIANS SHOULD  
WORK ON AN LINEAR  
SLIDE GATE OPERATOR



DO NOT INSTALL  
CONTROLS  
ON THE OPERATOR

# HSLG OPERATOR INSTALLATION GUIDE

## GATE OPERATOR CLASSIFICATIONS

All gate operators can be divided into one of four different classifications, depending on their design and usage.

### **Class I: Residential**

A vehicle gate operator (or system) intended for use in a home of one to four single-family dwellings, or a garage or parking area associated therewith.

### **Class II: Commercial or General Public Access**

A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single-family units), hotel, garage, retail store, or other building servicing the general public.

### **Class III: Industrial or Limited Access**

A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not intended to service the general public.

### **Class IV: Restricted Access**

A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

## **IMPORTANT!!**

Before installing the gate operator, make sure the gate's slide is free and level throughout the entire opening distance. If the gate does not seem to operate properly, it may affect the operator performance or greatly shorten the life of the unit. The gate should be designed so that airflow through the fabric is ample to prevent wind resistance and drag.



## **SAFETY INFORMATION AND WARNINGS**

Read the following before beginning to install LINEAR slide gate operators:

1. Read the yellow "Safety Instructions" brochure enclosed with the packet of information. If you do not have one, please call LINEAR at 1-800-333-1717 to request one. Read and follow all instructions.
2. All electrical connections to the power supply must be made by a licensed electrician and must observe all national and local electrical codes.
3. A separate power-disconnect switch should be located near the operator so that primary power can be turned off when necessary.
4. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
5. Never reach between, through or around the fence to operate the gate.
6. You must install all required safety equipment.

## **PRE-INSTALLATION INFORMATION**

Before unpacking, inspect the carton for exterior damage. If you find damage, advise the delivery carrier of a potential claim.

Inspect your package carefully. You can check your accessory box parts with the enclosed packing slip for your convenience. Claims for shortages will be honored for only 30 days from the date of shipment.

Before installing the operator, read this manual completely to ensure all requirements for proper installation are present. Verify that the voltage to be used matches the voltage of the operator.

**The following contact or non-contact obstruction detection devices have been approved for use with LINEAR slide gate operators as part of a UL325 compliant installation:**

### **Contact Edges:**

Miller Models\*: MG0-20, MGR-20, MGS-20, and ME-120

### **Photoeyes:**

|          |  |
|----------|--|
| 2520-441 | MMTC Model IR-55 photoeye, 165' with mounting hardware |
| 2520-031 | MMTC Model E3K photoeye, 28' with mounting hardware    |

*\*for LINEAR part numbers, contact a sales representative for details*

# HSLG OPERATOR INSTALLATION GUIDE

## WIRING SPECIFICATIONS

1. Select from the chart at the bottom of this page corresponding to the model, voltage and horsepower rating of your operator.
2. The distance shown on the chart is measured in feet from the operator to the power source. **DO NOT EXCEED THE MAXIMUM DISTANCE.** These calculations have been based on standard 115V and 230V supplies with a 10% drop allowable. If your supply is under the standard rating, the runs listed may be longer than what your application will handle, and you should not run wire too near the upper end of the chart for the gauge of wire you are using.
3. When large-gauge wire is used, a separate junction box (not supplied) may be needed for the operator power connection.
4. All control devices are now 24VDC, which can be run considerable distances. 24VAC is available for other devices, such as loop detectors and photo eyes.
5. Wire run calculations are based on the National Electrical Code, Article 430 and have been carefully determined based on motor inrush, brake solenoids, and operator requirements.
6. Connect power in accordance with local codes. **The green ground wire must be properly connected.**
7. Wire insulation must be suitable to the application.
8. Control wiring must be run in a separate conduit from power wiring. Running them together may cause interference and faulty signals in some accessories.
9. Electrical outlets are supplied in all 115VAC models for convenience with occasional use or low power consumption devices only. If you choose to run dedicated equipment from these devices, it will decrease the distance for maximum run and the charts will no longer be accurate.
10. A three-wire shielded conductor cable is required to connect master and slave operators. You must use Belden 8760 Twisted Pair Shielded Cable (or equivalent) **only** – LINEAR part number 2500-1982, per foot). See page 9 for details of this connection, as well as dip switch selection. **Note: The SHIELD wire should be connected in both the master and slave operators.**

## USE COPPER WIRE ONLY!

### MODEL HSLG – SINGLE PHASE

| Power Wiring |              |      |            |            |              |      |            |            |              |      |            |
|--------------|--------------|------|------------|------------|--------------|------|------------|------------|--------------|------|------------|
| Volts & HP   | Max Distance |      | Wire Gauge | Volts & HP | Max Distance |      | Wire Gauge | Volts & HP | Max Distance |      | Wire Gauge |
|              | Single       | Dual |            |            | Single       | Dual |            |            | Single       | Dual |            |
| 115V         | 222          | 111  | 12         | 208V       | 760          | 380  | 12         | 230V       | 894          | 447  | 12         |
|              | 354          | 177  | 10         |            | 1200         | 600  | 10         |            | 1422         | 711  | 10         |
|              | 566          | 283  | 8          |            | 1924         | 962  | 8          |            | 2264         | 1132 | 8          |
| 1/2 HP       | 900          | 450  | 6          | 1/2 HP     | 3060         | 1830 | 6          | 1/2 HP     | 3600         | 1800 | 6          |
|              | 1430         | 715  | 4          |            | 4864         | 2432 | 4          |            | 5724         | 2862 | 4          |
| 115V         | 178          | 89   | 12         | 208        | 604          | 302  | 12         | 230V       | 710          | 355  | 12         |
|              | 282          | 141  | 10         |            | 958          | 478  | 10         |            | 1128         | 564  | 10         |
|              | 450          | 225  | 8          |            | 1526         | 763  | 8          |            | 1796         | 898  | 8          |
| 3/4 HP       | 716          | 358  | 6          | 3/4 HP     | 2424         | 1212 | 6          | 3/4 HP     | 2852         | 1426 | 6          |
|              | 1140         | 570  | 4          |            | 3856         | 1928 | 4          |            | 4538         | 2269 | 4          |
| 115V         | 160          | 80   | 12         | 208V       | 544          | 272  | 12         | 230V       | 640          | 320  | 12         |
|              | 254          | 127  | 10         |            | 864          | 432  | 10         |            | 1016         | 508  | 10         |
|              | 406          | 203  | 8          |            | 1374         | 686  | 8          |            | 1616         | 808  | 8          |
| 1HP          | 646          | 323  | 6          | 1HP        | 2184         | 1092 | 6          | 1HP        | 2570         | 1285 | 6          |
|              | 1026         | 513  | 4          |            | 3476         | 1738 | 4          |            | 4090         | 2045 | 4          |

### ACCESSORY WIRING

| All Models                  |                        |            |
|-----------------------------|------------------------|------------|
| Volts                       | Maximum Distance (ft.) | Wire Gauge |
| 24VAC                       | 250<br>350*            | 14<br>12   |
| 24VDC                       | 0-2000                 | 14         |
| *Over 350 ft. use DC power. |                        |            |

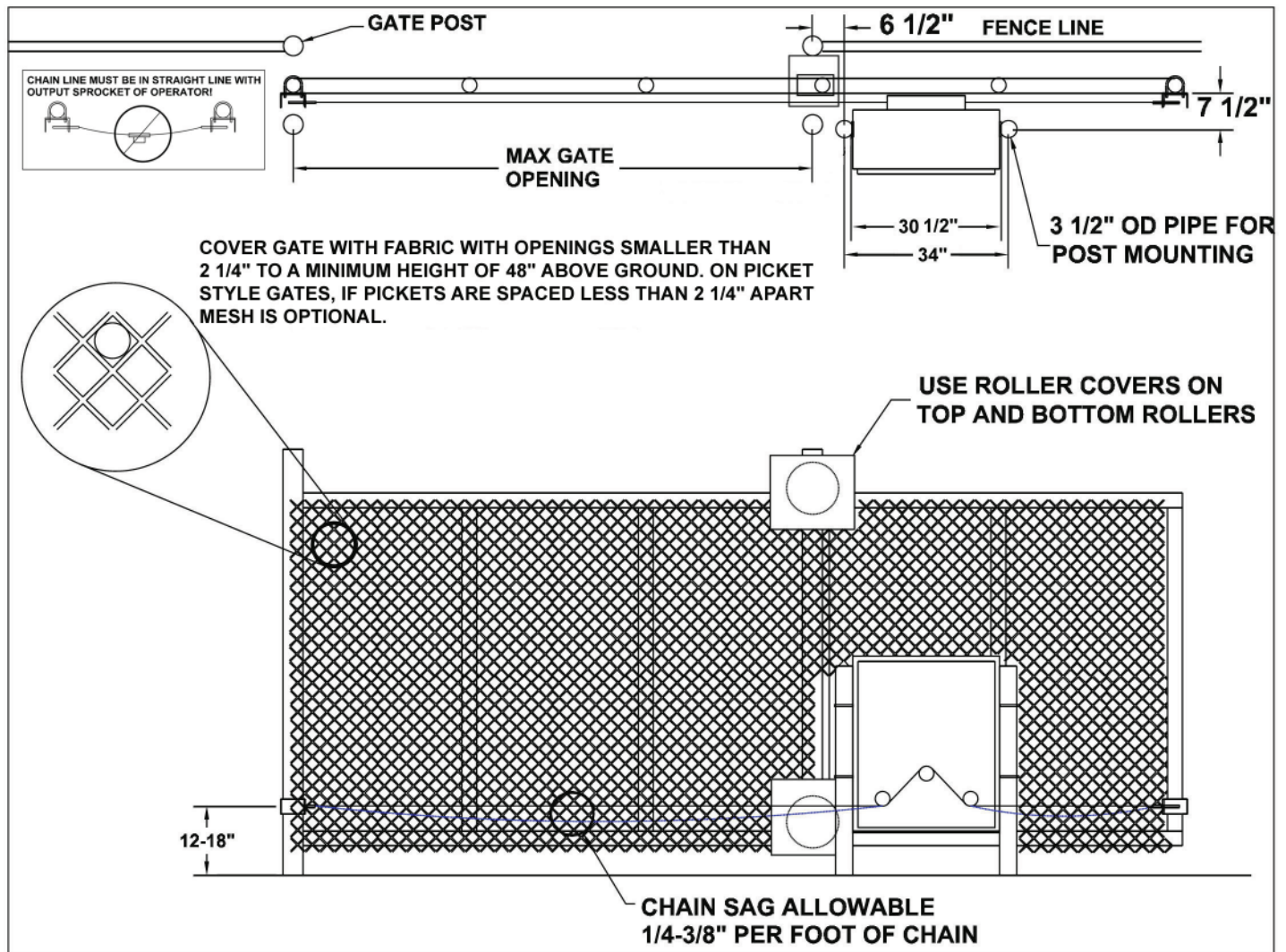
### MODEL HSLG – THREE PHASE

| Power Wiring: 3 Phase |                      |                    |               |                   |                      |                     |               |                   |                      |                      |               |
|-----------------------|----------------------|--------------------|---------------|-------------------|----------------------|---------------------|---------------|-------------------|----------------------|----------------------|---------------|
| Volts<br>& HP         | Max Distance         |                    | Wire<br>Gauge | Volts<br>& HP     | Max Distance         |                     | Wire<br>Gauge | Volts<br>& HP     | Max Distance         |                      | Wire<br>Gauge |
|                       | Single               | Dual               |               |                   | Single               | Dual                |               |                   | Single               | Dual                 |               |
| 208V<br>1/2<br>HP     | 1142<br>1816<br>2890 | 571<br>908<br>1445 | 12<br>10<br>8 | 230V<br>1/2<br>HP | 1344<br>2137<br>3400 | 672<br>1069<br>1700 | 12<br>10<br>8 | 460V<br>1/2<br>HP | 3841<br>6106<br>9712 | 1921<br>3053<br>4856 | 12<br>10<br>8 |
| 208V<br>3/4<br>HP     | 920<br>1464<br>2330  | 460<br>732<br>1165 | 12<br>10<br>8 | 230V<br>3/4<br>HP | 1084<br>1723<br>2741 | 542<br>862<br>1371  | 12<br>10<br>8 | 460V<br>3/4<br>HP | 3279<br>5212<br>8291 | 1640<br>2606<br>4146 | 12<br>10<br>8 |
| 208V<br><br>1HP       | 714<br>1136<br>1804  | 357<br>568<br>902  | 12<br>10<br>8 | 230V<br><br>1HP   | 840<br>1336<br>2124  | 420<br>668<br>1062  | 12<br>10<br>8 | 460V<br><br>1HP   | 2689<br>4274<br>6798 | 1345<br>2437<br>3399 | 12<br>10<br>8 |



# HSLG OPERATOR INSTALLATION GUIDE

## POST MOUNTING INSTRUCTIONS FOR MODEL HSLG



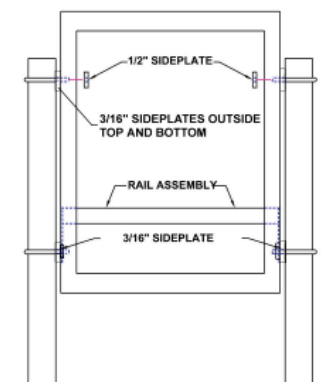
Before installing, make sure the gate rolls or slides freely, and that all exposed rollers are properly covered. The gate must be covered with fabric with openings no larger than 2 1/4" in size, to a minimum height of 48 inches from ground level. On picket-style gates, if pickets are spaced less than 2 1/4" apart, mesh is optional.

Use two 3 - 3 1/2" OD galvanized posts and secure with concrete footings as shown, length to be determined by local codes, frost line depth and soil conditions. Secure the operator to the posts using the 4" U-bolts, side plates, and hardware. There are a total of eight side plates. There are six 3/16" side plates which should be mounted on the outside top and bottom of the cabinet, two 3/16" side plates which go on the top inside and two 1/2" side plates which should be mounted on the inside top of the cabinet as shown in the illustration at the right.

To assemble the drive chain and gate brackets, refer to page 6. Make sure that the chain sag does not exceed recommended sizes and that the chain does not come into contact with the moving parts of the gate or ground.

For optional pad mounting instructions, see LINEAR drawing #2700-360.

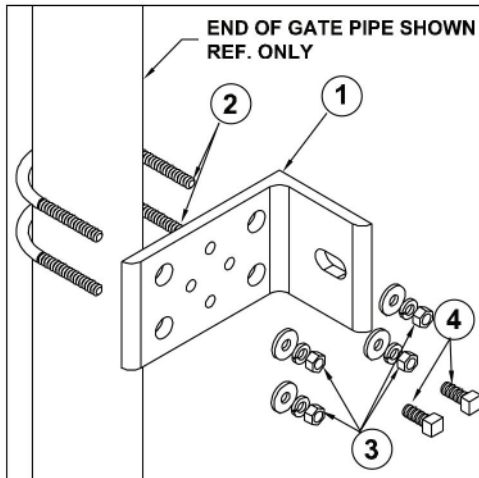
The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.



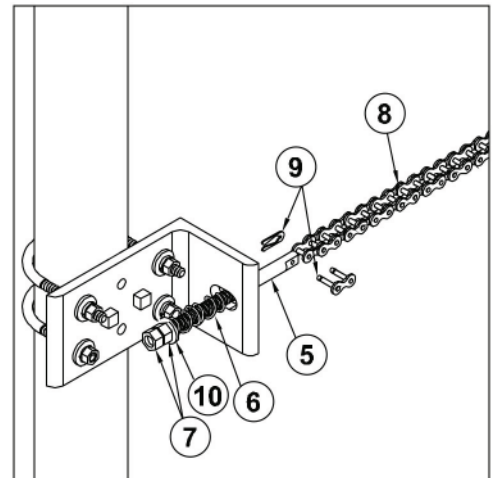
**SIDE PLATE INSTALLATION**

# HSLG OPERATOR INSTALLATION GUIDE

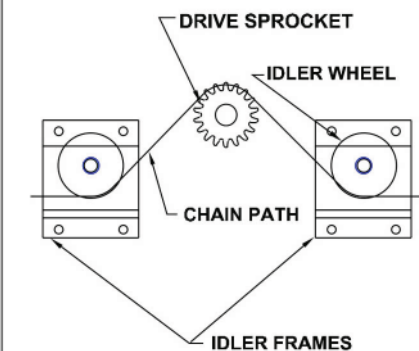
## GATE BRACKET AND CHAIN ASSEMBLY INSTRUCTIONS



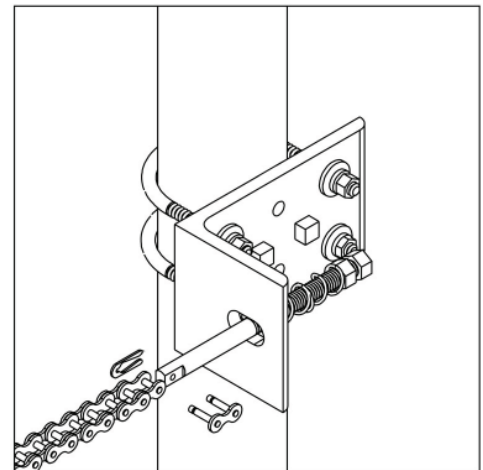
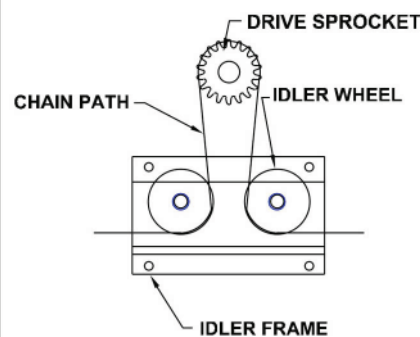
Numbered items in these drawings are for instructional reference only. For actual part numbers, go to the parts lists in the back of this booklet.



NOTE: IDLER CONFIGURATION MAY APPEAR DIFFERENT DEPENDING ON SLIDE OPERATOR MODEL



SOME MODELS MAY APPEAR MORE LIKE THIS:



Assemble a gate bracket (1) to the front edge of the gate, using two U-bolts (2), and mounting hardware (3). Before tightening down completely, be sure the bracket is parallel to the gate. Tighten the U-bolt hardware the rest of the way, then screw the square head bolts (4) into the threaded holes in the gate plate until they bottom out against the gate. These will help keep the bracket from twisting on the pipe.

Slide a threaded chain pin (5) through the bracket as shown, with spring (6), flat washer (10), and two hex nuts (7). Attach one end of the drive chain (8) to the chain pin using master link (9) and begin unrolling it toward the operator.

Remove the rain cover from the back of the slide gate operator. Carefully thread the drive chain under the first idler, over the drive sprocket, and then under the last idler. Make sure you feed most of the chain through the sprockets for attaching to the back end of the gate.

Assemble the other gate bracket on the rear edge of the gate, using the same process as you did with the front gate bracket. Once this is done, take the other chain pin, spring and jam nuts and assemble with the end of drive chain and the other master link.

At this point you should be able to adjust the chain tension by tightening the jam nuts on each end. Approximately 1/4" to 3/8" of slack per foot of drive chain is acceptable. Make sure the chain does not drag on the ground, across the gate rollers or the idler frame of the operator.

Additional mounting holes have been provided in the gate bracket for installer convenience.

# HSLG OPERATOR INSTALLATION GUIDE

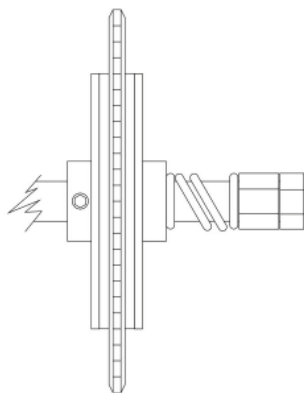
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## TORQUE LIMITER ADJUSTMENTS

Before adjusting the torque limiter, make sure the gate is in good working condition. One person should be able to move the gate by hand. Be certain the gate moves freely and without binding throughout its travel. Torque limiters are set light at the factory and must be adjusted during installation. Adjust the torque limiter tight enough to keep it from slipping during normal operation.

### **To adjust the torque limiter in model HSLG:**

1. Loosen the jam nut.
2. *To increase the output*, turn the adjustment nut clockwise one flat, or 1/6 turn, at a time until desired output is obtained.  
*To reduce the output*, turn the adjustment nut counterclockwise one flat, or 1/6 turn, at a time until desired output is obtained.
3. Tighten the jam nut against the adjustment nut when finished.



**MODEL HSLG**



# HSLG OPERATOR INSTALLATION GUIDE

## ELECTRICAL CONNECTION AND ADJUSTMENTS



Power supply must be of correct voltage and phase.  
Always disconnect power from operator before servicing.  
Keep clear of gate during operation.

All LINEAR gate operators are supplied with a power disconnect switch to turn on and off the power supply available to the operator. Incoming power should be brought into the operator and connected to the labeled pigtails in the disconnect box following wiring specifications on page 4. A wiring connections print can be found on the inside cover of the operator.

Proper thermal protection is supplied with the operator. The motor contains a thermal overload protector to protect from overheating the motor due to overload or high-frequency operation. This overload will automatically reset after the motor cools down.

## LIMIT NUT ADJUSTMENTS

The limit nuts are not preset at the factory and must be adjusted for the length of the gate the operator is installed on. The limit switches are activated by two threaded nylon rotary limit nuts which are attached to a threaded shaft and driven by chain and sprockets from the main drive shaft. Remove the cardboard filler before attempting to adjust the limit nuts.

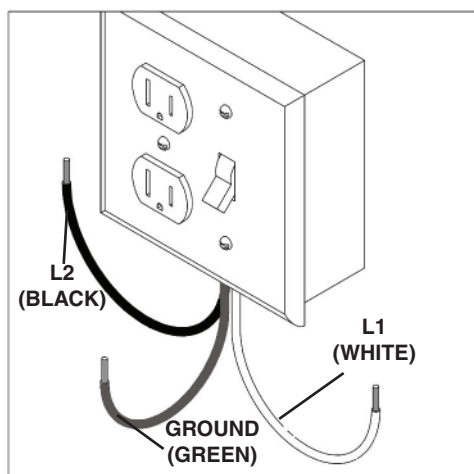
With the gate connected to the gate operator in a mid-travel position, and the power disconnect switch turned **OFF**, disconnect the operator by using the manual disconnect lever. Instructions for the manual disconnect can be found in the individual operator owner's guides. Once the operator has been disconnected, manually move the gate by hand to within a foot of its fully open position (the foot of distance is necessary to allow for coasting of the operator after the limit switch is tripped).

Once the gate is in this position, adjust the open limit nut until it activates the limit switch for open, **LSO-1**. Press down on the detent plate and rotate the nut along the threaded shaft. Refer to the illustration below for additional details.

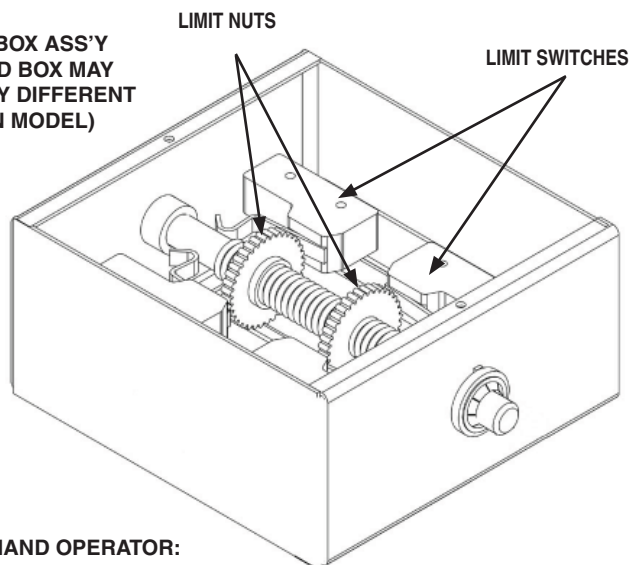
Once the open limit nut is set, repeat the above process for the close direction nut and the **LSC-1** limit switch.

After finishing the initial limit nut adjustments, reposition the gate to approximately its center of travel. Re-engage the operator and turn the power disconnect **ON**. Stand clear of any moving parts and press the **OPEN** button on the three-button station. If the gate begins to close instead of open, press the **STOP** button immediately. Find the dip switch block on the main control board and switch the hand of operation (dip switch #4, see page 9) and try to open the gate again. Observe the gate as it runs through a complete cycle in both directions, and adjust your limits again if necessary. Fine levels of adjustment can also be achieved by adjusting a few teeth on the nut at a time. If the gate stops in mid travel, the open or close current sensor adjustment or the maximum run timer may need adjustment (see page 11).

POWER DISCONNECT BOX  
(115VAC VERSION SHOWN)



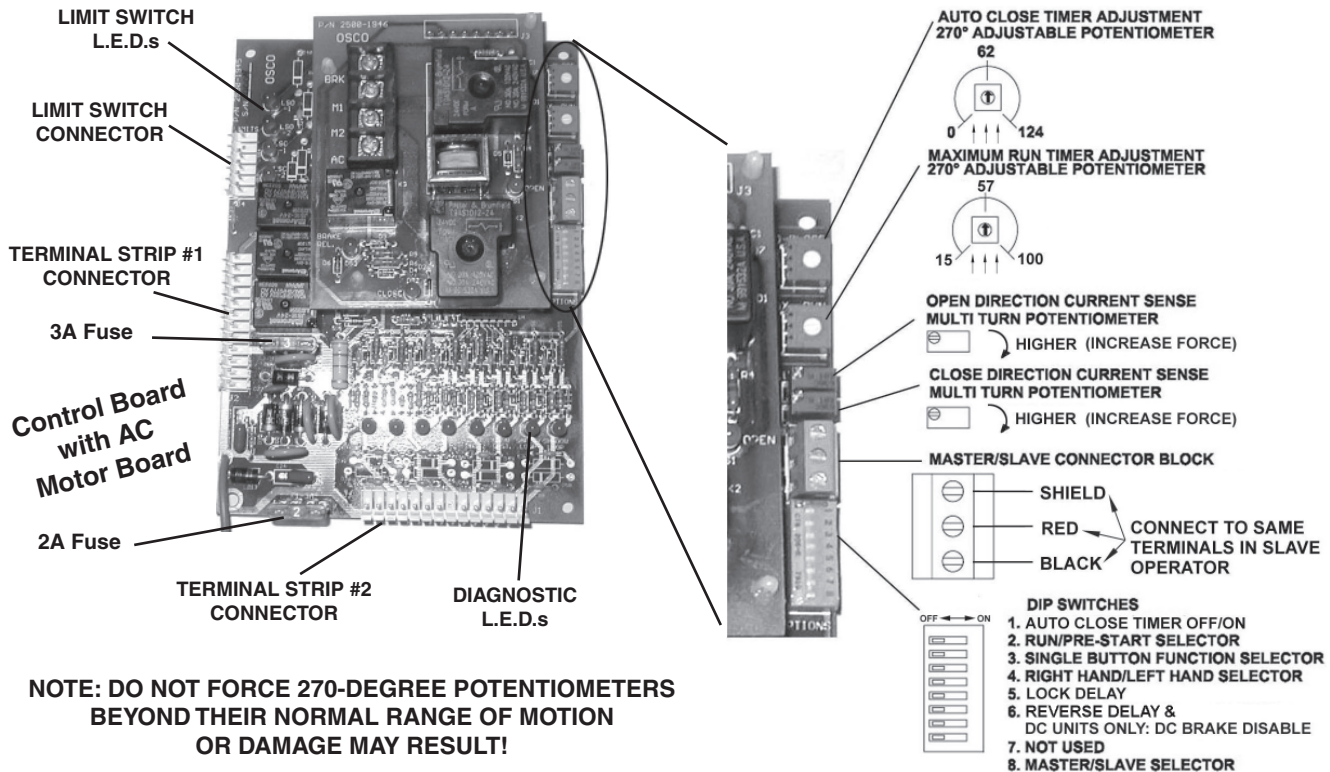
ROTARY LIMIT BOX ASS'Y  
(SWITCHES AND BOX MAY  
LOOK SLIGHTLY DIFFERENT  
DEPENDING ON MODEL)



ON A RIGHT-HAND OPERATOR:  
OPEN LIMIT SWITCH IS THE ONE CLOSER  
TO THE FRONT OF THE OPERATOR. ON A  
LEFT-HAND OPERATOR, THE OPEN LIMIT  
SWITCH IS THE ONE FURTHEST AWAY  
FROM THE FRONT OF THE OPERATOR.

# HSLG OPERATOR INSTALLATION GUIDE

## CONTROL BOARD ADJUSTMENTS



**Auto Close Timer Adjustment:** This 270-degree adjustable potentiometer will signal the operator to close automatically, provided no open, reversing or obstruction signals are present from the fully-open position. This timer is adjustable from 0 to 124 seconds. This feature is turned on or off using dip switch #1.

**Maximum Run Timer Adjustment:** This 270-degree adjustable potentiometer will signal the operator to stop running once it counts down, unless a limit switch is reached or an input is received first. Each time the motor starts, this timer will begin counting. This timer is adjustable from 15 to 100 seconds. If the timer expires, the unit locks out and the emergency alarm sounds.

**Open Direction Current Sense Adjustment:** This multi turn potentiometer is used to calibrate the built-in current sensing feature for detection of obstructions while running in the open direction.

**Close Direction Current Sense Adjustment:** This multi turn potentiometer is used to calibrate the built in current sensing feature for detection of obstructions while running in the closed direction.

**Master/Slave Connection Block:** This terminal block is used in conjunction with two operators to configure two gates to open and close together.


### Dip Switches:


- #1 This switch turns the auto close timer off/on.
- #2 This switch is used in conjunction with alarms and flashing lights that may be added to the operator. When the switch is in the **ON** position, these devices will start approximately two seconds prior to the operator starting. In the **OFF** position, the devices will only work while the operator is running.
- #3 This switch is used in conjunction with single-button controls and radio receivers. In the **ON** position, successive inputs will cause signals in the order of **OPEN-STOP-CLOSE-STOP**. In the **OFF** position, inputs will cause an **OPEN** signal unless the gate is fully open, in which case it will signal **CLOSE**.
- #4 This switch determines right-hand vs. left-hand behavior. When looking from inside the protected area toward the gate, the side of the drive the operator is on determines its hand of operation. In the **OFF** position, the operator is set for right-hand.
- #5 When turned **ON**, this switch will allow a one-second delay for solenoid locks to unlock before the motor starts.
- #6 In the **ON** position, the reverse delay is three seconds. In DC operators only, this also disables the inherent DC brake (provided the R2 brake resistor is cut, see picture above). In the **OFF** position, the reverse delay is 1 1/2 seconds and the DC inherent brake is enabled.
- #7 Not used at this time.
- #8 This switch is used to set Master/Slave configuration. Operators which are stand-alone or master units should be set to **OFF**, while only slave units should have this switch set to **ON**.

# HSLG OPERATOR INSTALLATION GUIDE

## TERMINAL CONNECTION DESCRIPTIONS

| TERMINALS              | FUNCTION          | DESCRIPTION OF FUNCTION  |
|------------------------|-------------------|--|
| 24VAC<br>24VAC N       | 24VAC             | Provides 24Volt AC power for accessories.<br><b>Note: DC models will NOT have 24Volt AC power available.</b>   |
| 24VDC+<br>24VDC- COMM. | 24VDC             | Provides 24Volt DC power for accessories.  |
| 1 & 4                  | OPEN              | Opens the operator. Several accessories such as button stations, keypads, transmitters and card readers can be wired to open.  |
| 3 & 4                  | CLOSE             | Closes the operator. Use caution when wiring accessories to these terminals. <b>The gate must be clearly visible from the location of any accessories wired to close.</b>  |
| 4 & 5                  | SINGLE-BUTTON     | Performs the single-button function which will alternate between open and close or open, stop and close - depending on dip switch #3. (See page 9 for details.)  |
| 2 & 4                  | STOP              | Stops the operator. If no stop button is used, a jumper is required across <b>2&amp;4</b> .  |
| 4 & 6                  | REVERSE           | This function will cause a reversal when the gate is traveling closed and will travel back to the fully open position. Loop detectors are often wired for reverse.   |
| 4 & 50                 | OPEN OBSTRUCTION  | This function works only while the operator is opening. Any signal to this function will cause the gate to stop, reverse a short distance, and then stop again. At this time the auto close timer is disabled, and a renewed input will be required to start the gate again. Should the gate be restarted and the signal occur again prior to reaching a limit, the gate will stop again, and this time will sound the emergency alarm and lock out. |
| 4 & 51                 | CLOSE OBSTRUCTION | This function works exactly like the OPEN OBSTRUCTION, except that it will only work in the closing direction.   |
| 4 & 11                 | SHADOW/HOLD       | This function will keep the gate in its fully open position while the signal is present. This is typically used with a loop and loop detector to keep a large swing gate open while vehicular traffic is passing through.  |
| 24VDC+ & 60            | RUN/PRE-START     | A 24Volt DC device such as a strobe light or alarm can be wired to these terminals. Depending on dip switch #2, these devices will either begin three seconds before the operator starts, or only while the motor is running. (See page 9 for details.)  |

 **You must follow all required safety precautions and instructions at all times. Review the safety brochure included with the operator. If any pages are missing or unreadable, contact LINEAR at 1-800-333-1717 to request additional copies.**

 **Controls intended for user activation must be located at least six feet (6') 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.**

 **Do not adjust the circuit board current sensing feature too high. It should be adjusted high enough to keep the gate from falsely triggering the sensing, but no higher than necessary for the gate to operate. Do not defeat the purpose of this function!**

# HSLG OPERATOR INSTALLATION GUIDE

## CURRENT SENSING ADJUSTMENTS

Because gates vary in construction and may have different force requirements in the open and close directions to move, the LINEAR control board has separate Multi-turn potentiometers for adjusting in both directions independently. The adjustment should be set light enough to maintain minimal force (50-75 lbs.) should an obstruction occur, but high enough to keep the gate moving under normal conditions without interruption.

Prior to adjusting the operator current sensing functions, make sure the gate moves freely in both directions. A badly aligned or poorly maintained gate may cause false triggering of the current sensor. Refer to page 9 when following the instructions below. A factory adjustment tool has been supplied to make these adjustments easier. This tool has been taped to the control box for your convenience.

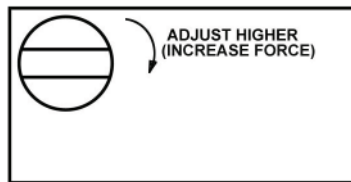
### CLOSE DIRECTION CURRENT SENSE ADJUSTMENT

When the gate operator leaves the factory, it has been preset for a relatively light gate function and will require additional adjustment. Begin by starting the gate going closed. If the operator stops and reverses, turn the close direction potentiometer (see page 9) one turn higher, press the **STOP** button, and try again. Repeat this process until the gate no longer causes false tripping of the current sensor. Note that each time the gate operator reverses, the **STOP** button must be pressed. Next, turn the close direction potentiometer lower slowly while the operator is running the gate closed until the gate operator stops and reverses again. From this point, turn the close direction potentiometer higher by 1 1/2 turns for all 115 Volt AC and 24 Volt DC operators, and by 3/4 of a turn higher for all 230 Volt AC operators. Additional fine adjustment by 1/4 turns may be necessary to eliminate false triggering.

### OPEN DIRECTION CURRENT SENSE ADJUSTMENT

Repeat the same process with the open direction potentiometer while running the gate in the open direction. Once this is done, run the gate through several complete cycles and make sure the gate does not false trip in either direction.

Multi-turn Potentiometer



Remember it is important not to set the adjustment too high! Doing so will defeat the purpose of the current sensing as an obstruction detecting feature.

### MAXIMUM RUN TIMER ADJUSTMENT

This adjustable potentiometer sets the maximum length of time the motor will run before shutting down. It should be configured for the time it takes to run the gate fully open or closed, plus an additional 15 seconds. See page 9 for details.

### AUTO CLOSE TIMER ADJUSTMENT

This adjustable potentiometer sets the length of time which elapses before the gate operator automatically closes the gate, from the fully open position, provided no open, reversing, or obstruction signals are present. This feature can be turned on or off via dip switch selection. See page 9 for details. **Do not use the auto close timer without an appropriate reversing device installed!**

### MASTER/SLAVE CONNECTION

A three-wire shielded conductor cable is required to connect master and slave operators. You must use Belden 8760 Twisted Pair Shielded Cable (or equivalent) **only** – LINEAR part number 2500-1982, per foot). See page 9 for details of this connection, as well as dip switch selection. Note: The SHIELD wire should be connected in both the master and slave operators. **In addition, you must run power to both the master and slave operators.**

# HSLG OPERATOR INSTALLATION GUIDE

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## ONBOARD L.E.D. INDICATOR DESCRIPTIONS

### Control Board L.E.D. Indicators:

|                            |   |
|----------------------------|---|
| <b>OPEN</b>                | This indicator is lit when an open signal is present. This signal can come from such devices as button stations, radio receivers, keypads and telephone entry systems.  |
| <b>CLOSE</b>               | This indicator is lit when a closed signal is present. This signal typically comes from three-button stations.  |
| <b>STOP</b>                | This indicator is lit when there is a break in the stop circuit. Make sure there is a stop button wired in and working properly.  |
| <b>SINGLE</b>              | This indicator is lit when a signal from a single-button station or radio receiver is present.  |
| <b>CLOSE OBST</b>          | This indicator is lit when a <b>close obstruction</b> signal is present. This signal can come from edges and photo eyes which have been wired to the close obstruction inputs.  |
| <b>OPEN OBST</b>           | This indicator is lit when an <b>open obstruction</b> signal is present. This signal can come from edges and photo eyes which have been wired to the open obstruction inputs.   |
| <b>SAFETY LOOP</b>         | This indicator is lit when a reversing signal is present. This signal is generated by a loop detector wired to the safety loop terminals.   |
| <b>SHADOW LOOP</b>         | This indicator is lit when a shadow/hold open signal is present. This signal is generated by a loop detector wired to the shadow loop terminals.  |
| <b><u>LH</u><br/>LSC-1</b> | This indicator is lit when the open #1 limit switch is activated on a right-hand operator, or the close #1 switch on a left-hand. If this indicator is lit and the gate is not in its full open/closed position, the limit may need adjusting or the limit switch may need replacing. |
| <b><u>RH</u><br/>LSO-1</b> |   |
| <b>LSC-2</b>               | This indicator is lit when the open #2 limit switch is activated on a right-hand operator, or the close #2 switch on a left-hand.   |
| <b>LSO-2</b>               |   |
| <b>LSO-1</b>               | This indicator is lit when the close #1 limit switch is activated on a right-hand operator, or the open #1 on a left-hand. If this indicator is lit and the gate is not in its full open/closed position, the limit may need adjusting or the limit switch may need replacing.        |
| <b>LSC-1</b>               |   |
| <b>LSO-2</b>               | This indicator is lit when the close #2 limit switch is activated on a right-hand operator, or the open #2 switch on a left-hand.   |
| <b>LSC-2</b>               |   |

### Motor Board L.E.D. Indicators:

|                    |  |
|--------------------|--|
| <b>NON LABELED</b> | One of these two indicators will be lit when the motor is running the gate open, and the other is lit when the motor is running the gate closed. |
| <b>BRAKE REL.</b>  | This indicator is lit when the brake is NOT applied.   |



## IMPORTANT NOTES FOR INSTALLATION OF MASTER/SLAVE APPLICATIONS

- Set Dip Switch #4 to proper hand of operation (right-hand or left-hand)
- Set Dip Switch #8 as Master (off)

- Current Sensing
- Maximum Run Timer
- One-Second Lock Release
- Three-Second Pre-Start Warning
- Right/Left-Hand Selections

The diagram illustrates the wiring for the control board. On the left, a terminal block is shown with a label "ATTACH MODULE HERE". It includes a "GND" terminal and several screw terminals. A "GREEN" wire is connected to the "GND" terminal. A "RED" wire is connected to a "24VDC+" source. Another "RED" wire is connected to a "2A" source. The "GREEN" wire is also connected to a "GROUND SCREW".

On the right, a diode bridge circuit is shown. It consists of six diodes arranged in a bridge configuration. The input wires are labeled "BLK 1", "BLK 3", "BLK 5", "BLK", "BLK", and "BLK". The output wires are labeled "RED" and "RED".

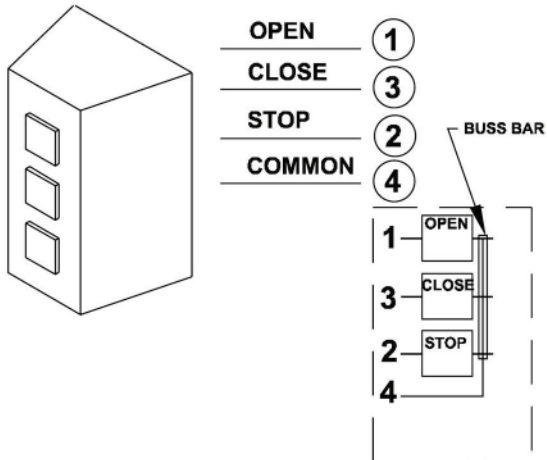
CONNECT THESE TWO TO ANY INPUT THAT HAS AN ACCESSORY WIRED TO IT. REVERSING (6), SHADOW (11), OPEN OBSTR. (50), CLOSE OBSTR. (51). THESE SHOULD BE CONNECTED ON THE SCREWS WITH THE CONTROL BOARD MOTOR HARNESS WIRES.

- 13 -

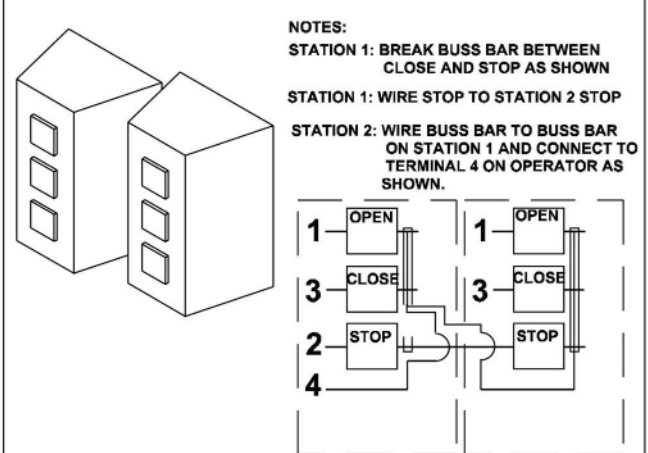
# HSLG OPERATOR INSTALLATION GUIDE

## CONTROL and ACCESSORY CONNECTION ILLUSTRATIONS

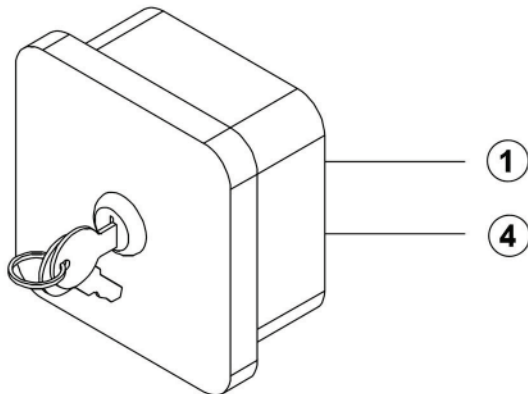
### THREE BUTTON STATION



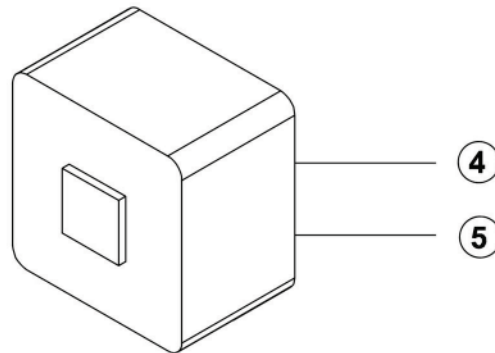
### DUAL THREE BUTTON STATION



### KEYSWITCH (TO OPEN)

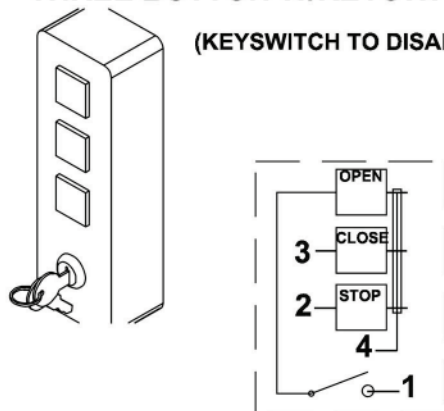


### SINGLE BUTTON STATION (OPEN/CLOSE)

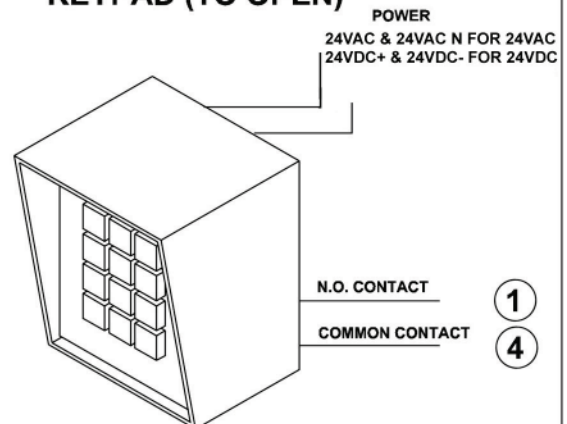


### THREE BUTTON W/KEYSWITCH

(KEYSWITCH TO DISABLE OPEN)



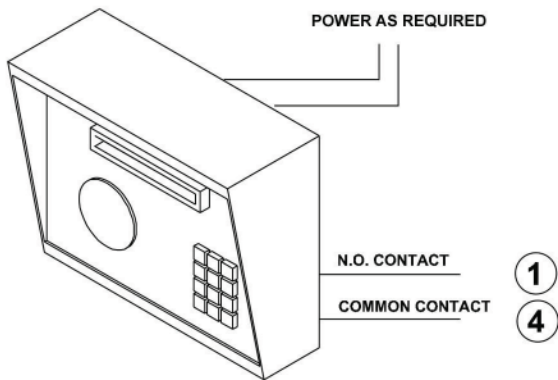
### KEYPAD (TO OPEN)



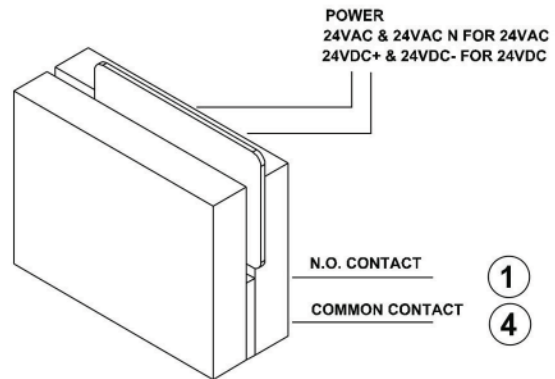
# HSLG OPERATOR INSTALLATION GUIDE

## CONTROL and ACCESSORY CONNECTION ILLUSTRATIONS

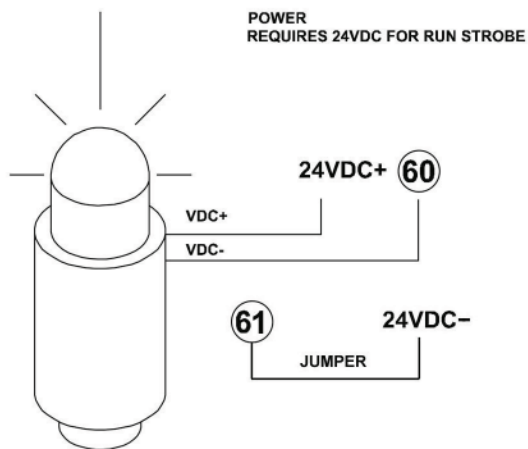
### TELEPHONE ENTRY SYSTEM (TO OPEN)



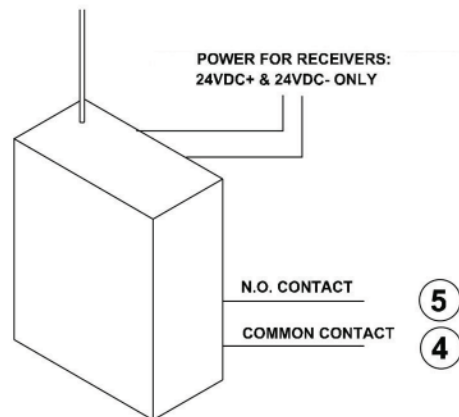
### CARD READER (TO OPEN)



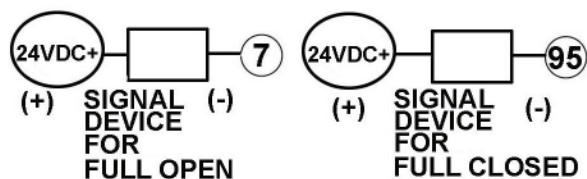
### STROBE (WIRED FOR RUN)



### FOUR WIRE RECEIVER (OPEN/CLOSE)



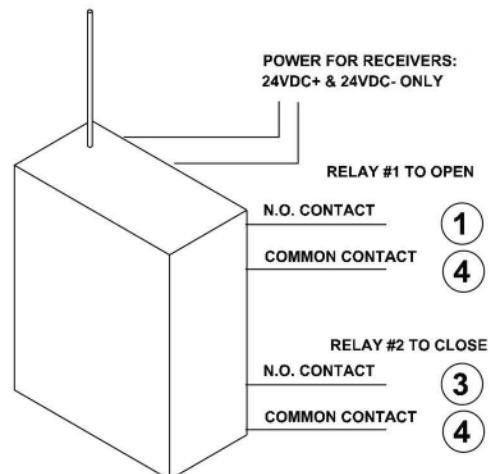
### AUXILIARY SIGNALING DEVICE 24VDC



SHOWN FOR RIGHT HAND INSTALLATION;  
LEFT HAND OPPOSITE

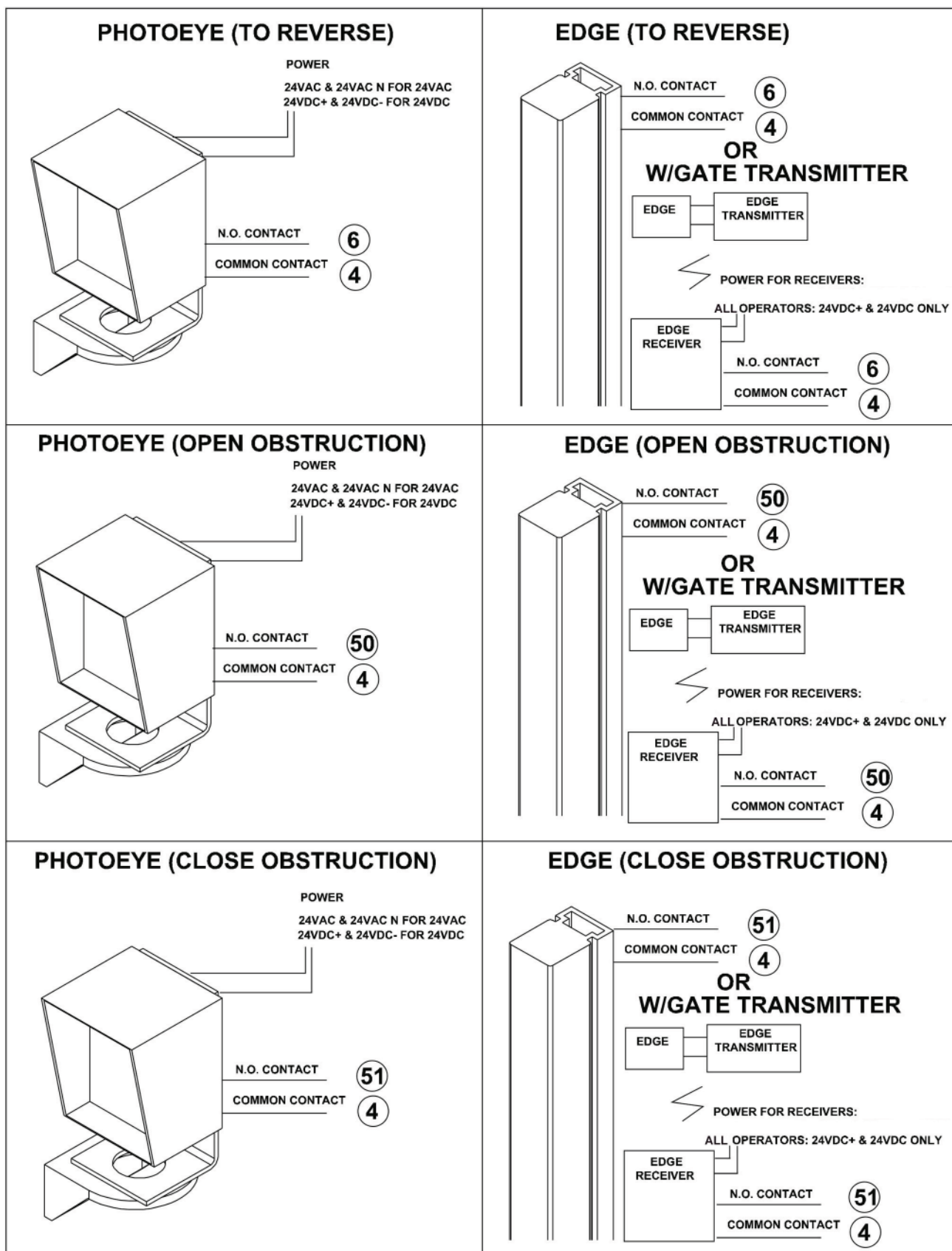
FOR OTHER VOLTAGES, AN OPTIONAL 24VDC  
RELAY IS REQUIRED. CONSULT THE  
FACTORY.

### TWO CHANNEL RECEIVER (OPEN/CLOSE)



# HSLG OPERATOR INSTALLATION GUIDE

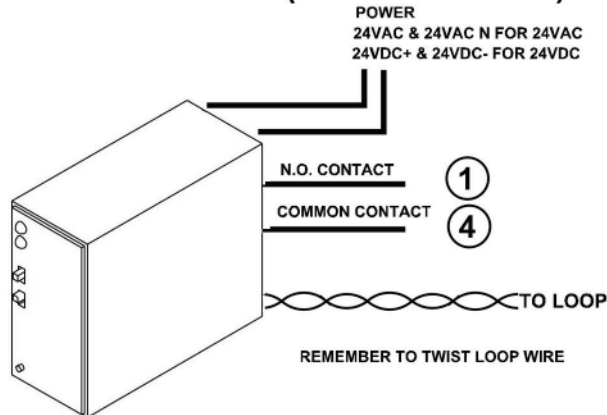
## CONTROL and ACCESSORY CONNECTION ILLUSTRATIONS



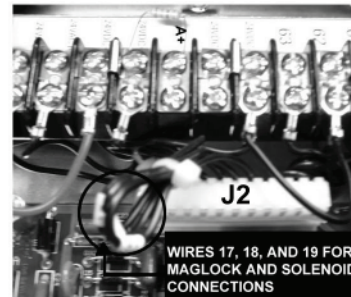
# HSLG OPERATOR INSTALLATION GUIDE

## CONTROL and ACCESSORY CONNECTION ILLUSTRATIONS

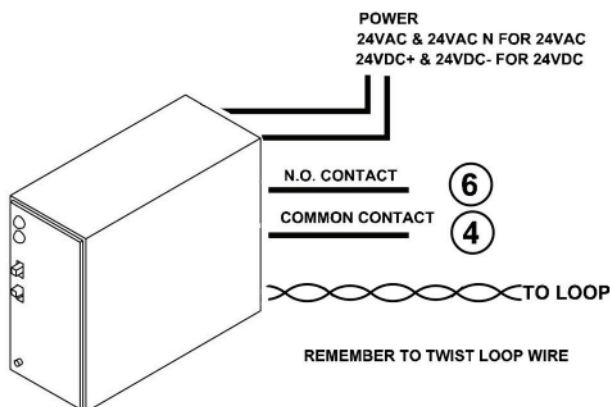
### LOOP DETECTOR (OPEN/FREE EXIT)



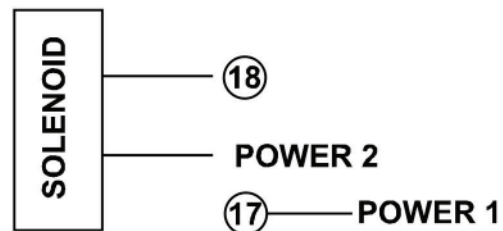
WIRES 17, 18, AND 19 ARE LOCATED IN THE MIDDLE OF THE J2 CONNECTOR



### LOOP DETECTOR (TO REVERSE)

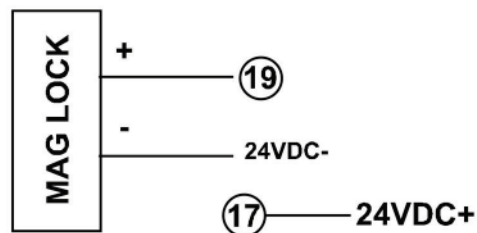


### SOLENOID LOCK

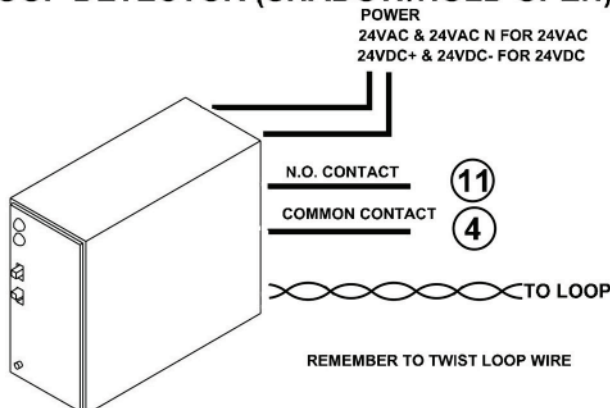


MAKE SURE TO MATCH POWER VOLTAGE TO LOCK RATING (17 & 18 ARE NORMALLY OPEN CONTACTS, 10 AMP RATING)

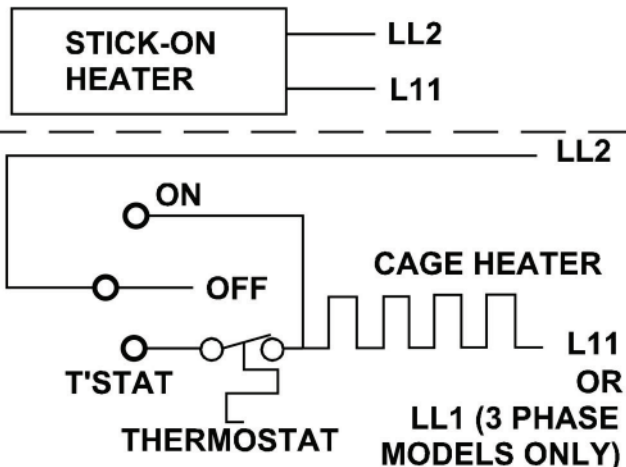
### 24VDC MAGLOCK



### LOOP DETECTOR (SHADOW/HOLD OPEN)



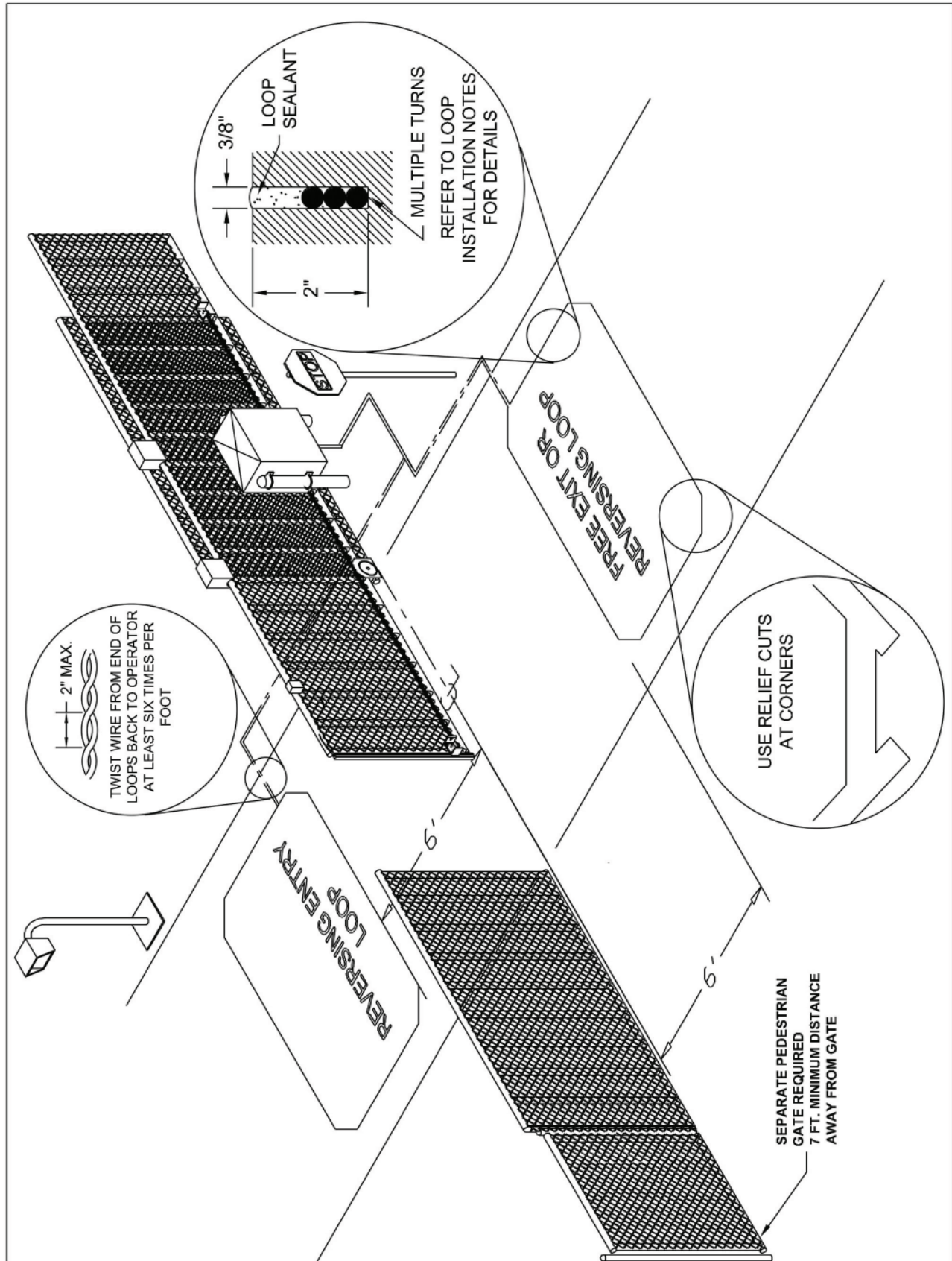
### HEATER ASSEMBLIES (AC MODELS ONLY)





# HSLG OPERATOR INSTALLATION GUIDE

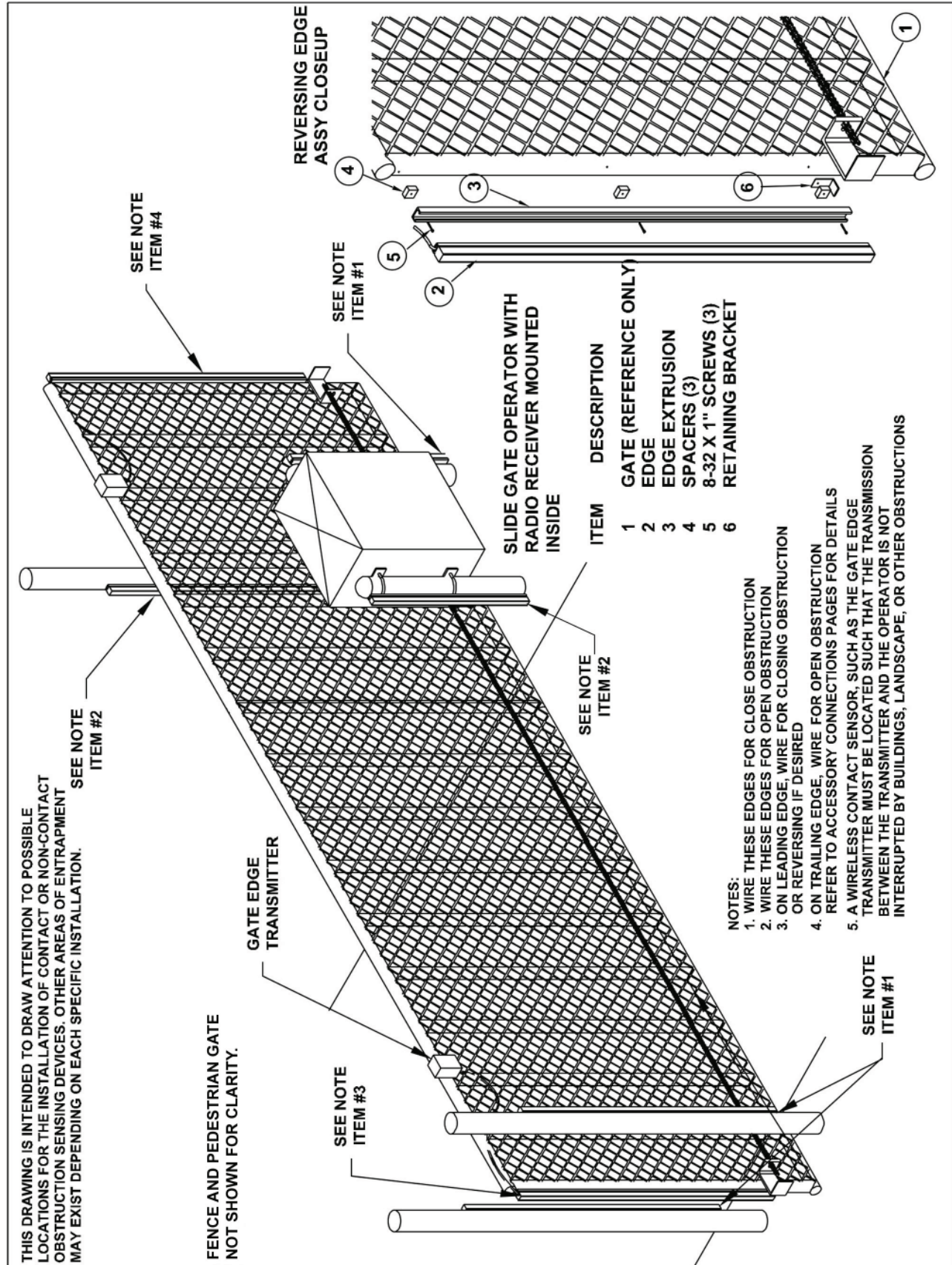
## LOOP LAYOUT ILLUSTRATION



Refer to Connection Descriptions on page 10 and Loop Accessory Connections on page 17 for details.

# HSLG OPERATOR INSTALLATION GUIDE

## EDGE LAYOUT ILLUSTRATION #1

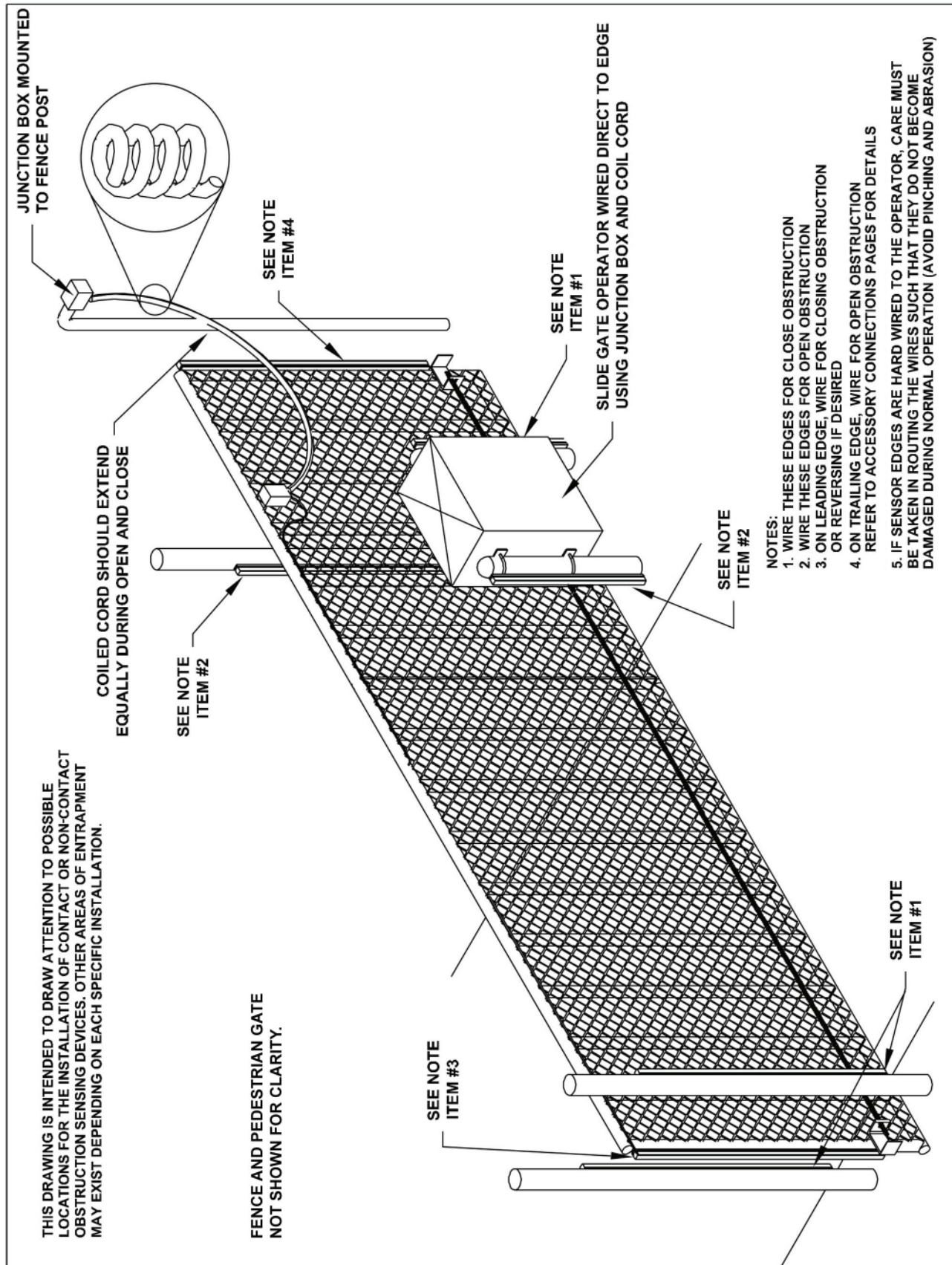


Refer to Connection Descriptions on page 10 and Contact Edge Connections on page 16 for details.



# HSLG OPERATOR INSTALLATION GUIDE

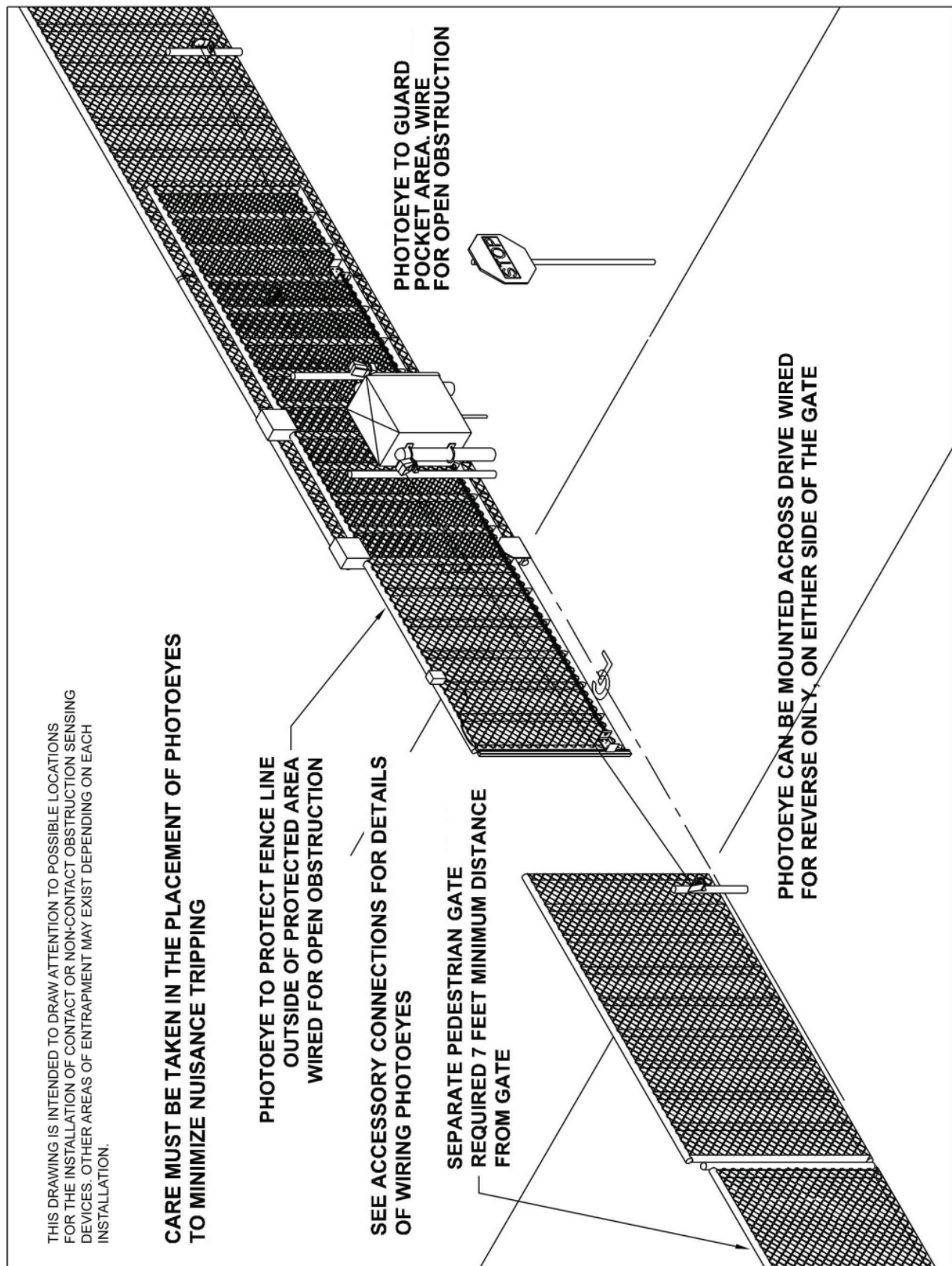
## EDGE LAYOUT ILLUSTRATION #2



Refer to Connection Descriptions on page 10 and Contact Edge Connections on page 16 for details.

# HSLG OPERATOR INSTALLATION GUIDE

## PHOTO EYE ILLUSTRATION

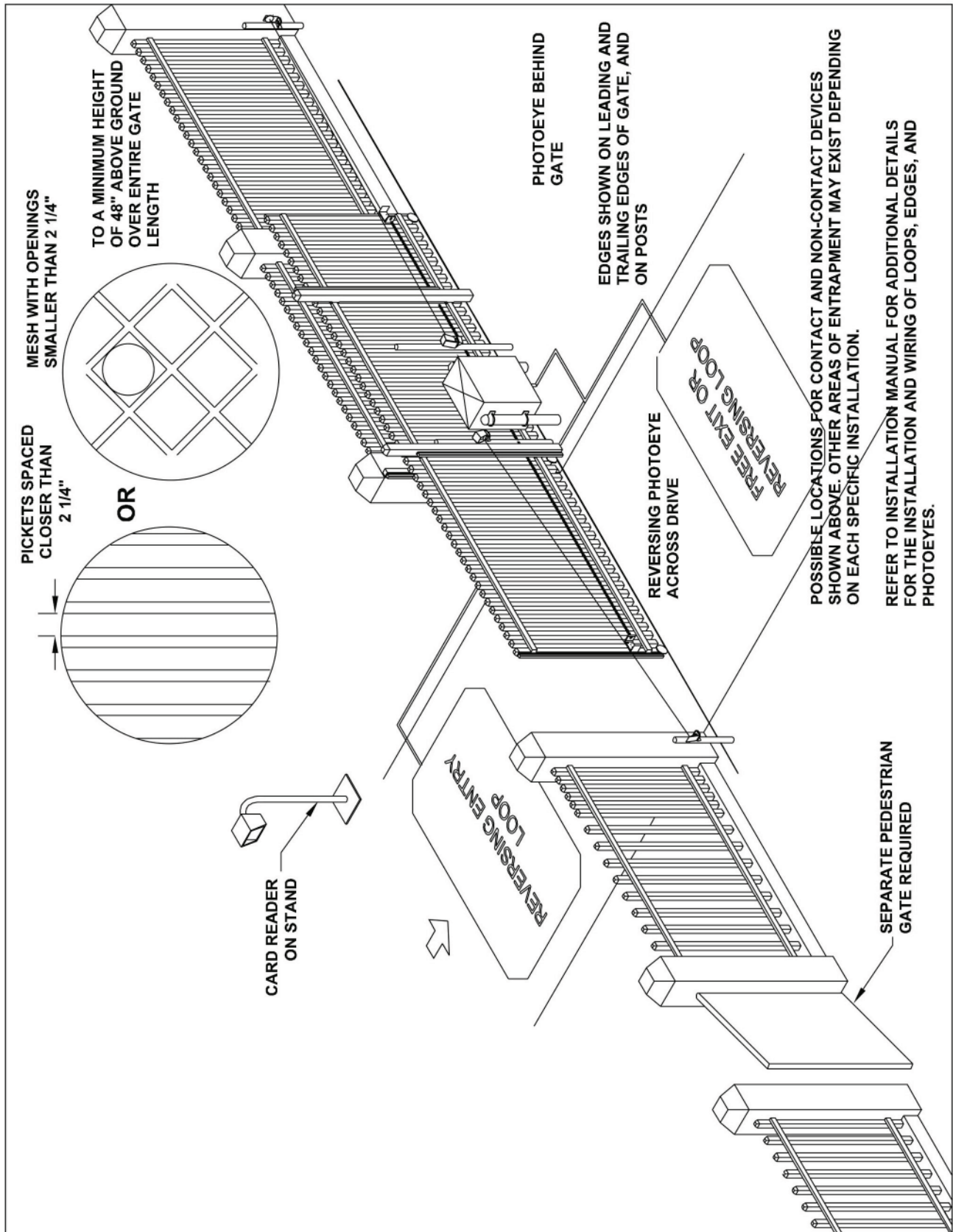


Refer to Connection Descriptions on page 10 and Photo Eye Connections on page 16 for details.



# HSLG OPERATOR INSTALLATION GUIDE

## PICKET GATE ILLUSTRATION

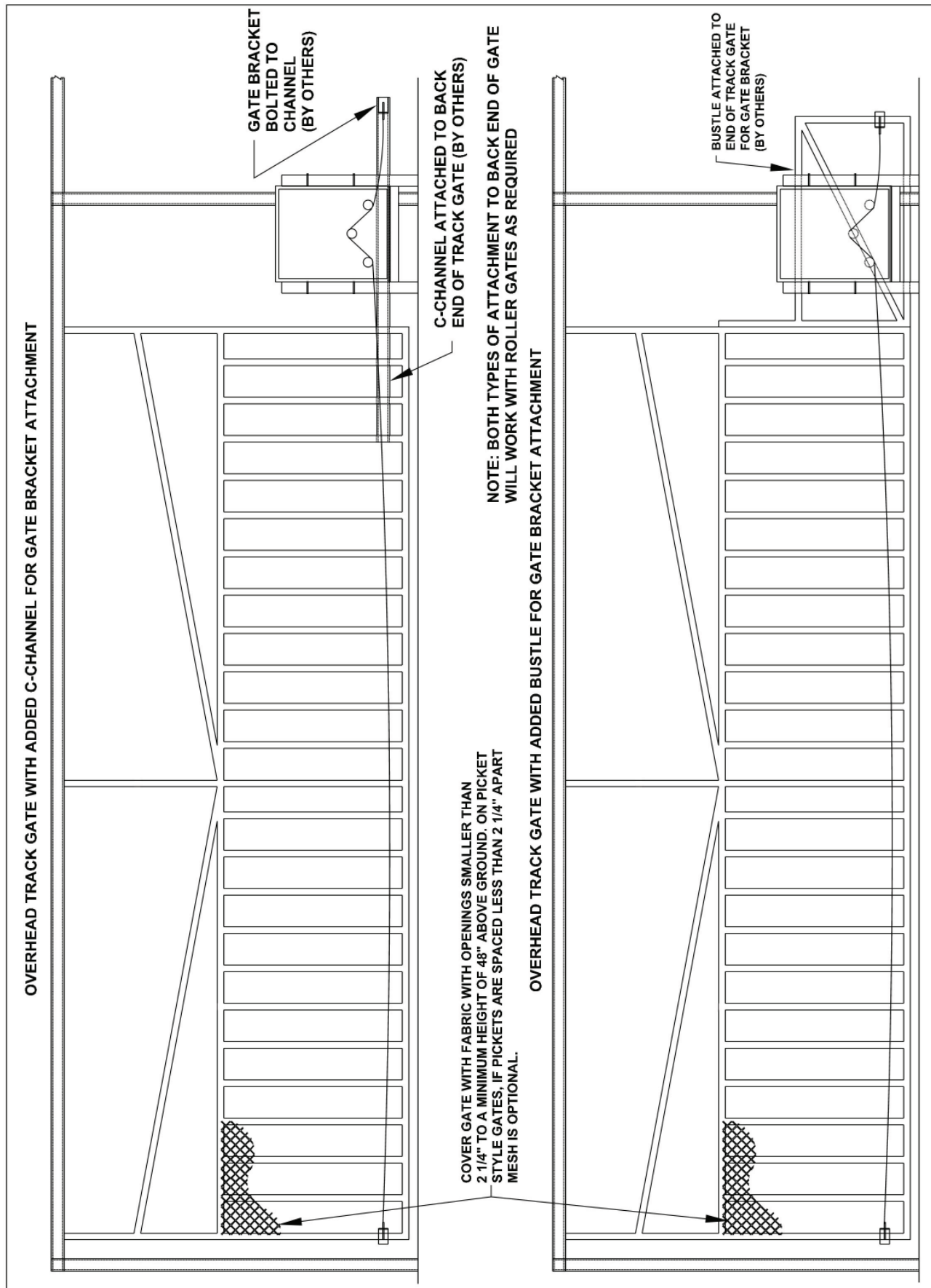


Refer to Connection Descriptions on page 10 and Accessory Connections on pages 14-17 for additional details.



# HSLG OPERATOR INSTALLATION GUIDE

## TRACK GATE ILLUSTRATION



# HSLG OPERATOR INSTALLATION GUIDE

## TROUBLESHOOTING

### ***Operator fails to start:***

- A. If the operator has been running a large number of cycles, the motor may have gotten hot and tripped the overload. Allow the motor to cool down and the overload will reset automatically.
- B. Make sure you have power at the master distribution panel and that the power has not been turned off.
- C. The secondary fuse on the control board may have blown. Replace the fuse (refer to control box parts list on pages **27** [single phase] or **28** [three phase] for part number information).

### ***Motor operates, but gate does not move:***

- A. In operators with torque limiters and friction pad clutches, check for signs of slipping. You can mark the sprocket and clutch with a yellow or white grease pen and watch for the lines to move apart if slipping is taking place. Adjust the torque limiter tighter if this is the problem.
- B. Check for broken chain or worn belts.
- C. Check all setscrews on pulleys and sprockets and tighten them if necessary, and check for keys which may have fallen loose from keyways.

### ***Motor sounds like it is working harder than normal:***

- A. Make sure the gate is moving freely and without binding throughout its entire travel.
- B. Check the drive chain for obstructions (if the operator has one).
- C. If the operator has an internal brake mechanism, make sure it is releasing.

### ***Limit switch getting out of time:***

- A. Check for proper tension on all limit chains to be sure there is no jumping taking place. Mark one tooth and its corresponding link and run the gate. If the marks have moved, the chain is skipping.
- B. Check the setscrews in limit cams and limit sprockets for tightness. In rotary limit boxes, check the rotary limit nut for sloppiness or stripped threads. Replace if necessary.
- C. Check the chain tension along the output sprocket and idlers. Mark the chain and one tooth of the sprocket as described above and run the gate. Check for jumping.

### ***Gate stopping part way open or closed (but no visible obstruction):***

- A. The control board may have received a false obstruction input triggered by current sensing set too low. Make sure the gate moves freely through its entire travel before adjusting the current sensing.
- B. The maximum run timer may have counted down and expired. This can be caused by having the timer set too low, if a chain or belt is broken, or if a sprocket or pulley is slipping. When the timer expires, the gate stops and an alarm will sound.
- C. An obstruction signal from an accessory wired to the obstruction input may have triggered falsely. Check the control board for lit L.E.D. indicators for any of the following inputs: safety, shadow, open obstruction, close obstruction, stop, etc. If any are lit when the operator should be running, remove all devices hooked to that function and hook them up one at a time and try to run the operator until the problem device is found. Refer to page **12** for details on the control board indicators.

### ***Gate staying open with automatic system:***

- A. If there are vehicle detectors in your machine which are set up for reverse, one of your loops or loop detectors may be sending a false signal. Disconnect the wire harness and try running the operator.
- B. An opening or reversing device may be stuck or malfunctioning. Try disconnecting these devices and hook them back up one at a time and try running the operator until the malfunctioning device is found.
- C. Make sure the close limit switch isn't activated. If it is, the operator will think the gate is already closed.

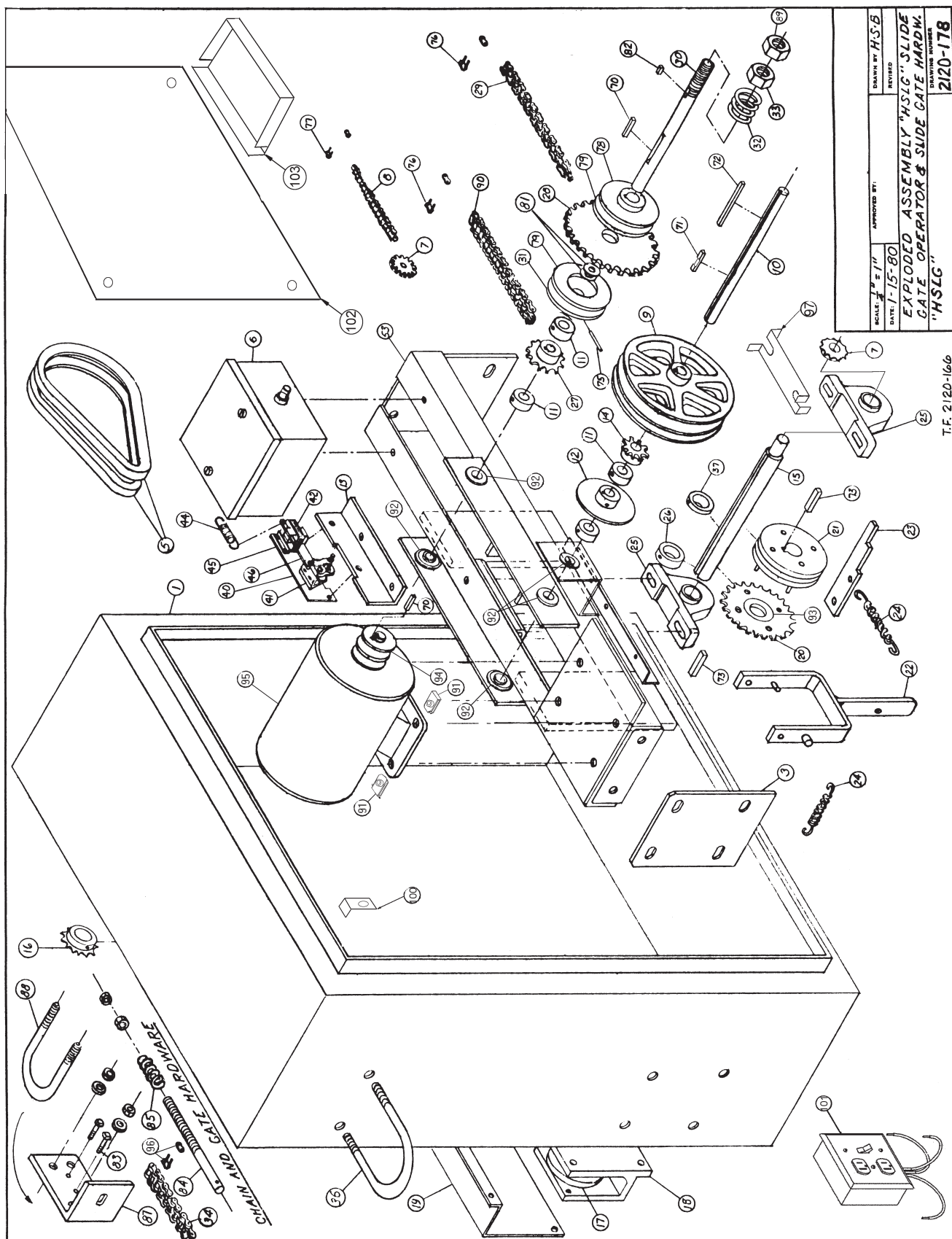
## **HOW TO ORDER REPLACEMENT PARTS**

Use the part numbers listed on the following pages. Contact your **local LINEAR dealer** or **distributor** to order parts.

1. Supply the model number and serial number of your operator.
2. Specify the quantity of pieces needed and order by part number and name of part.
3. State whether to ship by freight, truck, parcel post, UPS or air express.
4. State whether transportation charges are to be prepaid or collect.
5. Specify name and address of person or company to whom parts are to be shipped.
6. Specify name and address of person or company to whom invoice is to be sent.

# HSLG OPERATOR INSTALLATION GUIDE

## MODEL HSLG MECHANICAL PARTS EXPLODED VIEW



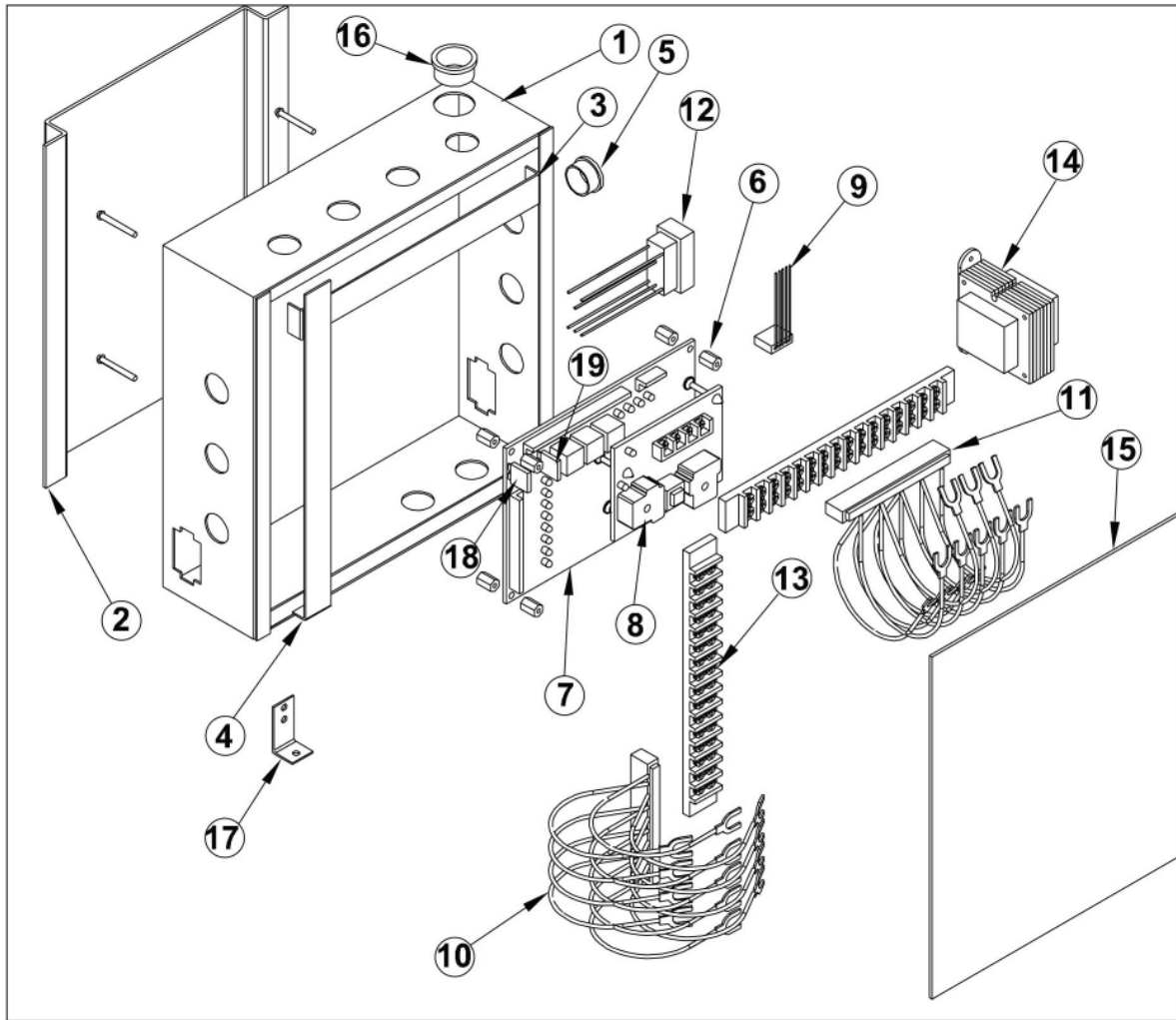
# HSLG OPERATOR INSTALLATION GUIDE

## MODEL HSLG MECHANICAL PARTS LIST

| REF NO. | PART NO.  | DESCRIPTION  | REF NO. | PART NO.    | DESCRIPTION  |
|---------|-----------|--|---------|-------------|--|
|         | 2110-240  | Intermediate Shaft Assembly                          |         |             | <b>Motors</b>  |
| 10      | 2100-765  | Pulley Shaft   | 95      | 2500-2307   | 1/2 HP, 115V, 1 Phase  |
| 14      | 2200-213  | Sprocket, 41-B-9, 5/8" bore                          |         | 2500-2308   | 1/2 HP, 208/230V, 1 Phase  |
| 9       | 2200-309  | Double Pulley, 7"                                    |         | 2500-2309   | 3/4 HP, 115V, 1 Phase  |
| 11      | 2200-233  | Set Collar Set, 5/8"                                 |         | 2500-2310   | 3/4 HP, 208/230V, 1 Phase  |
| 92      | 2200-215  | Precision Bearing, 5/8"                              |         | 2500-2311   | 1 HP, 115V, 1 Phase  |
| 72      | 2200-333  | Key, 3/16" x 1 1/2"                                  |         | 2500-2312   | 1 HP, 208/230V, 1 Phase  |
| 71      | 2100-1750 | Key, 3/16" x 1 1/4"                                  |         | 2500-2313   | 1/2 HP, 208/230/460V, 3 Phase  |
| 12      | 2100-547  | Brake Disc   |         | 2500-2314   | 3/4 HP, 208/230/460V, 3 Phase  |
|         |           |  |         | 2500-2315   | 1 HP, 208/230/460V, 3 Phase  |
|         | 2110-274  | Clutch Shaft Assembly                                |         |             | <b>Capacitors</b>  |
| 30      | 2100-1008 | Clutch Shaft   |         | 2500-2336   | Capacitor for 2500-2307 Motor  |
| 28      | 2200-294  | Sprocket, 41-A-36, 1" bore                           |         | 2500-2337   | Capacitor for 2500-2308 Motor  |
| 31      | 2100-669  | Clutch Hub (pinned)                                  |         | 2500-1926   | Capacitor #1 for 2500-2309 Motor                                     |
| 78      | 2100-1007 | Clutch Hub (keyed)                                   |         | 2500-1930   | Capacitor #2 for 2500-2309 Motor                                     |
| 79      | 2100-564  | Clutch Facing  |         | 2500-1931   | Capacitor for 2500-2310 Motor  |
| 32      | 2200-306  | Clutch Spring  |         | 2500-2338   | Capacitor for 2500-2311 Motor  |
| 33      | 2400-061  | Hex Nut, 5/8"-18                                     |         | 2500-1932   | Capacitor for 2500-2312 Motor  |
| 89      | 2400-062  | Jam Nut, 5/8"-18                                     |         |             |  |
| 81      | 2400-187  | Thrust Washer, 1" x 1/8"                             |         |             | <b>Magnetic Brakes (includes 41, 42, 44, 45 and 46)</b>              |
|         | 2400-088  | Roll Pin, 3/16" x 1 3/8"                             | 40      | 2510-398    | 115V   |
| 27      | 2200-292  | Sprocket, 41-B-12, 5/8" bore                         |         | 2510-399    | 230V   |
|         | 2200-215  | Precision Bearing, 5/8"                              |         | 2510-400    | 460V   |
| 11      | 2200-233  | Set Collar, 5/8"                                     | 41      | 2220-983    | Brake and Puck Assembly  |
| 70      | 2400-238  | Key, 3/16" x 1 1/4"                                  | 42      | 2500-177    | Brake Solenoid, 230 VAC  |
| 82      | 2400-273  | Key, 3/16" x 1/4"                                    |         | 2500-178    | Brake Solenoid, 115 VAC  |
|         |           |  |         | 2500-1351   | Brake Solenoid, 460 VAC  |
|         | 2110-236  | Output Shaft Assembly                                | 44      | 2200-243    | Brake Spring (short)   |
| 15      | 2100-917  | Output Shaft, 1"                                     | 46      | 2100-548    | Brake Rod  |
| 20      | 2220-022  | Sprocket, 41-A-24 with Bearing                       | 45      | 2100-541    | Brake Plate  |
| 93      | 2200-119  | Bearing only for 41-A-24 Sprocket                    | 13      | 2100-2091   | Bracket for Brake  |
| 21      | 2110-131  | Shifter Block with Pins                              |         |             |  |
| 25      | 2200-274  | Pillow Block Bearing, 1"                             | 1       | 2120-359-BT | Enclosure Assembly Complete with Door                                |
| 97      | 2100-1737 | Pillow Block Retaining Plate                         |         | 2120-360-BT | Door Assembly only   |
| 37      | 2200-014  | Set Collar, 1" x 3/8" LTB                            |         | 2300-716    | Stop/Reset Button Cover  |
| 26      | 2200-091  | Set Collar, 1" x 5/8" LTB                            |         | 2110-643    | Lock Assembly with Keys  |
| 73      | 2400-201  | Key, 1/4" x 1 1/2"                                   |         | 2200-540    | Replacement Key  |
|         |           |  | 53      | 2110-234    | Rail Assembly  |
| 16      | 2200-968  | Sprocket, 40-B-22, 1" bore                           | 3       | 2100-573    | Spacer Plate   |
|         | 2400-026  | Spring Pin, 3/16" x 1" (Predrilled for Pillow Block) | 94      | 2200-207    | Double Pulley, 2"  |
|         |           |  | 29      | 2400-149    | Chain, #41, 30 Links   |
| 18      | 2110-700  | Idler Assembly                                       | 22      | 2120-132    | Shifter Lever  |
|         |           |  | 23      | 2100-910    | Locking Disconnect Lever   |
| 6       | 2520-173R | Rotary Limit Box Assembly                            | 24      | 2200-291    | Disconnect Spring  |
|         | 2500-764  | Limit Switch   | 19      | 2100-657-BT | Rain Cover   |
|         | 2100-057  | Standard Limit Shaft                                 | 75      | 2400-088    | Roll Pin   |
|         | 2200-030  | Limit Nut  | 87      | 2100-2007   | Gate Bracket   |
|         | 2100-261  | Detent Plate   | 88      | 2400-170    | U-Bolt, 3"   |
|         | 2110-162  | Limit Box Enclosure with Cover                       | 84      | 2100-258    | Chain Tension Bolt, 1/2"   |
|         | 2100-756  | Limit Box Cover only                                 | 85      | 2200-306    | Clutch/Chain Tension Spring  |
|         | 2200-029  | Flange Bearing, 1/2" ID                              | 86      | 2400-090    | Hex Nut, 1/2"-13 (4)   |
|         | 2200-193  | E-Ring, 1/2"   |         | 2400-045    | Flat Washer, 1/2"  |
|         | 2400-203  | Spring Washer, 1/2"                                  |         | 2500-867    | Alarm, 24VAC   |
| 7       | 2200-008  | Limit Drive Sprocket, 48-B-10, 1/2" bore             | 5       | 2200-234    | V-Belt, 28"  |
|         |           | For Drives up to 30 feet wide:                       |         | 2100-553    | Bearing Spacer   |
|         | 2200-008  | Limit Box Sprocket, 48-B-10, 1/2" bore               | 90      | 2200-150    | #41 Chain, per foot (20 links required)                              |
|         | 2200-654  | #48 Chain, per foot, 27 Links required               | 76      | 2200-027    | #41 Master Link  |
|         |           | For Drives from 31 to 45 feet wide:                  |         | 2100-656-BT | Side Plate, 1/2"   |
|         | 2200-041  | Limit Box Sprocket, 48-B-15, 1/2" bore               |         | 2100-059-BT | Side Plate, 3/16"  |
|         | 2200-654  | #48 Chain, per foot, 29 Links required               | 96      | 2200-006    | #40 Master Link  |
|         |           | For Drives over 45 feet wide:                        | 8       | 2200-654    | #48 Chain, per foot (27 links required)                              |
|         | 2200-276  | Limit Box Sprocket, 48-B-20, 1/2" bore               | 77      | 2200-010    | #48 Master Link  |
|         | 2200-654  | #48 Chain, per foot, 30 Links required               | 91      | 2400-422    | 5/16-18 U-Nut (4)  |
| 34      | 2200-202  | #40 Chain, per foot                                  | 100     | 2510-248    | Stop/Reset Button and Bracket Assembly                               |
| 36      | 2400-038  | U-Bolt, 4 5/8"                                       |         | 2100-1760   | Stop/Reset Button Mounting Bracket                                   |
|         |           | 2510-064 Three-Button Station with Lead              |         | 2500-1495   | Stop/Reset Button  |
| Wires   |           |  | 101     | 2510-251-D  | Power On/Off Disconnect Assembly with Receptacles (115V Models only) |
|         |           |  |         | 2500-1956   | 115VAC Duplex Receptacles only                                       |
| 102     | 2100-1756 | Control Box Mounting Plate                           |         | 2500-1957   | 115VAC Switch only   |
| 103     | 2100-1781 | Accessory Shelf for Single Phase Models only         |         | 2510-252-D  | Power On/Off Disconnect Assembly for 230VAC Models                   |
|         |           |  |         | 2500-2205   | 230VAC Switch only   |
|         |           |  | 101     | 2510-294    | Power On/Off Disconnect Assembly for 3 Phase Operators               |
|         |           |  |         | 2500-034    | Power Switch only  |



# HSLG OPERATOR INSTALLATION GUIDE

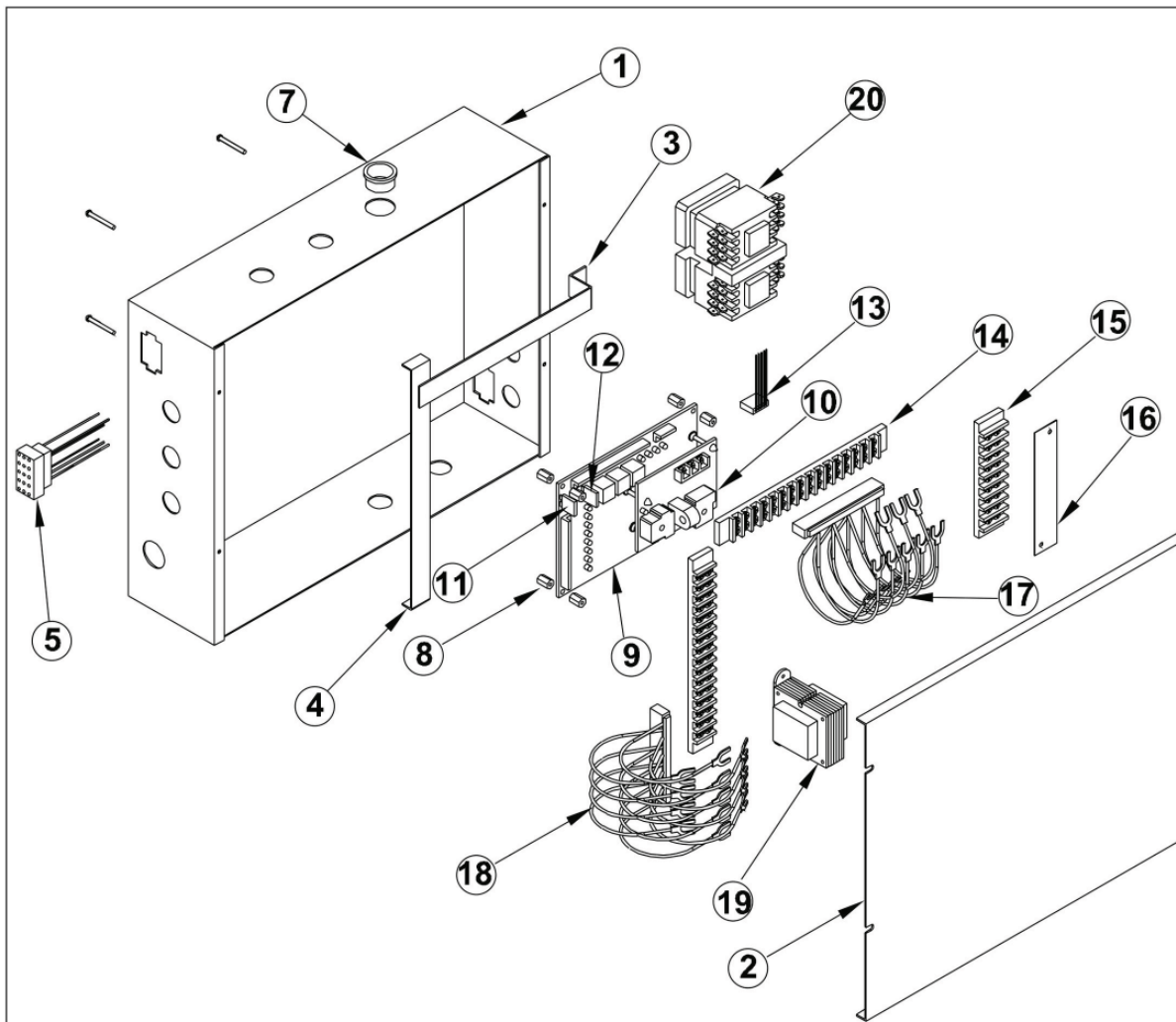


## MODEL **HSLG** SINGLE PHASE CONTROL BOX PARTS LIST

| REF NO. | PART NO.  | DESCRIPTION                         | REF NO. | PART NO.   | DESCRIPTION  |
|---------|-----------|-------------------------------------|---------|------------|--|
| 1       | 2100-1778 | Control Box Wrapper                 | 15      | 2300-696   | Clear Control Box Cover  |
| 2       | 2100-1757 | Control Box Mounting Plate          | 16      | 2300-735   | Heyco Bushing, 1.09 diameter   |
| 3       | 2100-1762 | Terminal Strip Bracket, Output Side | 17      | 2200-876   | Plunger, Spring Loaded   |
| 4       | 2100-1761 | Terminal Strip Bracket, Input Side  |         | 2500-867   | Alarm, 24VAC (not shown)   |
| 5       | 2200-122  | Heyco Bushing, .87 diameter         |         |            |  |
| 6       | 2500-1948 | Control Board Standoff              | 18      | 2500-1966  | 2 Amp Fuse for Control Board   |
| 7       | 2510-268  | Control Board                       | 19      | 2500-1975  | 3 Amp Fuse for Control Board   |
| 8       | 2500-1946 | AC Motor Drive Board                |         | 2520-391-D | Complete Controller Assembly 115VAC (order limit harness and mounting brackets separately) |
|         | 2510-244  | Control Board with AC Motor Board   |         | 2520-392-D | Complete Controller Assembly 230VAC (order limit harness and mounting brackets separately) |
| 9       | 2510-253  | Limit Switch Harness Assembly       |         |            |  |
| 10      | 2510-249  | Input Wire Harness Assembly         |         |            |  |
| 11      | 2510-250  | Output Wire Harness Assembly        |         |            |  |
| 12      | 2510-261  | Control Box Motor Harness Assembly  |         |            |  |
| 13      | 2500-071  | Terminal Strip, 16-141              |         |            |  |
| 14      | 2500-212  | Transformer, 115/24VAC 40VA         |         |            |  |
|         | 2500-791  | Transformer, 230/24VAC 40VA         |         |            |  |



# HSLG OPERATOR INSTALLATION GUIDE



## MODEL **HSLG** THREE PHASE CONTROL BOX PARTS LIST

| REF NO. | PART NO.  | DESCRIPTION  | REF NO. | PART NO.  | DESCRIPTION  |
|---------|-----------|--|---------|-----------|--|
| 1       | 2100-1865 | Control Box Wrapper                                  | 14      | 2500-071  | Terminal Strip, 16-141                                 |
| 2       | 2100-1866 | Control Box Cover                                    | 15      | 2500-270  | Terminal Strip, 9-142 <b>OR</b>                        |
| 3       | 2100-1864 | Terminal Strip Bracket                               |         | 2500-185  | Terminal Strip, 13-142                                 |
| 4       | 2100-1762 | Terminal Strip Bracket                               | 16      | 2300-488  | Terminal Strip Barrier for 9-142 <b>OR</b>             |
| 5       | 2510-293  | Control Box Motor Harness Assembly (Leeson motors)   |         | 2300-585  | Terminal Strip Barrier for 13-142                      |
|         | 2510-355  | Control Box Motor Harness Assembly (AO Smith motors) | 17      | 2510-250  | Output Wire Harness Assembly                           |
| 7       | 2300-735  | Heyco Bushing, 1.09 diameter                         | 18      | 2510-249  | Input Wire Harness Assembly                            |
| 8       | 2500-1948 | Control Board Standoff                               | 19      | 2500-767  | 230/24VAC, 75VA, Transformer                           |
| 9       | 2510-295  | Control Board with 3 Phase Motor Board               |         | 2500-768  | 460/24VAC, 75VA, Transformer                           |
|         | 2510-268  | Control Board only                                   | 20      | 2500-2084 | 24VAC Contactor  |
| 10      | 2500-1980 | 3 Phase Motor Board                                  |         | 2520-400  | Controller, 208/230, 3 Phase                           |
| 11      | 2500-1966 | 2 Amp Fuse for Control Board                         |         | 2520-401  | Controller, 460, 3 Phase                               |
| 12      | 2500-1975 | 3 Amp Fuse for Control Board                         |         |           | (order limit harness and mounting hardware separately) |
| 13      | 2510-253  | Limit Switch Harness                                 |         |           |  |

# HSLG OPERATOR INSTALLATION GUIDE

## PREVENTATIVE MAINTENANCE

### IMPORTANT!

- Always disconnect power from operator before servicing.
- Keep clear of gate during operation.

### GENERAL:

LINEAR gate operators are designed for many years of trouble-free operation and, under recommended operating conditions, will require only minimal maintenance. To ensure that your unit is ready for operation at all times--and to preclude serious damage or failure--inspect the unit systematically. Proper adjustments and lubrication should be made as recommended.

### LUBRICATION:

**Bearings.** For models which have pillow block style bearings with greaseable fittings, lubricate at least twice a year with a lithium complex based, petroleum oil NLGI 2 rated grease. Oilite and precision sealed bearings do not require additional lubrication.

**Motor.** Motors have sealed ball bearings and do not require further lubrication. If bearing noise develops after several years of operation, bearings should be replaced by a motor repair company, or the motor should be replaced if necessary.

**Drive Chain and Sprocket (slide gate models only).** The main drive chain and sprockets should be inspected for wear, cleaned, and wiped down with a lightly oiled rag every six months.

**Swing Gate Arm (swing gate models only).** Check all bolts for proper tension and tighten if necessary. Make sure the arm folds overextends itself slightly against the over travel stop to reduce the chance that the gate can be back driven open. Adjust the close limit slightly if additional travel is required. Lightly lubricate all pivot points with a light machine oil.

**Barrier Gate Arm (barrier gate models only).** Check all bolts for proper tension and tighten if necessary. If the arm has been warped or damaged, replace as necessary.

### ADDITIONAL SIX MONTH PREVENTATIVE MAINTENANCE:

1. For operators which utilize torque limiting clutches, check for proper tightness. If there appears to be dust from wear on the pads, inspect the pads and replace if necessary. If the clutch cannot be adjusted tightly enough to move the gate without slipping, the pads must be replaced.
2. For operators with V-belts, inspect for wear and replace as necessary. Check for proper tension and adjust if required. Check all pulley setscrews for tightness and tighten if necessary.
3. For operators with internal chain drives, inspect chain and sprockets for wear and replace if necessary. Check for proper tension and alignment, and adjust if required. Check all hub sprocket setscrews and tighten if required.
4. Check limit switches and limit actuators (cams, limit nuts, etc.) for wear and replace as required. In rotary limit switch assemblies, wipe the limit shaft clean and apply a light coating of dry lubricant.
5. For operators with magnetic brakes, check for proper adjustment. Brake disc must run free when the brake is engaged. For brake assemblies other than C-face style, the brake should be adjusted so that the solenoid plunger throw is between 3/8" to 1/2". Too much throw will damage the solenoid. **If the solenoid emits a loud buzzing sound when the motor is run, the brake must be adjusted.**
6. In operators which have a disconnect handle, inspect disconnect handle for proper function and lubricate if necessary. Use a lithium based grease on all moving parts.
7. Inspect all nuts and bolts for proper tightness and tighten as necessary.
8. Check all reversing devices for proper function. Inspect all contact edges for wear and replace if required. Check photo-eyes for proper alignment and function.
9. Check current sensing for proper adjustment when finished with inspection and maintenance.
10. Inspect the installation area. Are all the warning signs intact and visible? If they are missing or need replaced, contact LINEAR. Be sure there are no control stations mounted within reach of the gate. Review safety literature with the customer and advise them to remove any such stations found.

**For slide and swing gate operators, you must inspect the gate for proper operation. The gate should move easily without binding through its entire travel. If the gate does bind, adjust or fix as required. Failure to keep the gate in good working condition will have adverse effects on the operator.**

# HSLG OPERATOR INSTALLATION GUIDE

## GATE OPERATOR INSTALLATION CHECKLIST

| INSTALLER | CUSTOMER |  |
|-----------|----------|--|
| _____     | _____    | 1. The gate has been checked to make sure it is level and moves freely in both directions.   |
| _____     | _____    | 2. Potential pinch areas have been guarded so as to be inaccessible <b>OR</b> have contact and/or non-contact obstruction sensing devices installed.   |
| _____     | _____    | 3. The installer has installed one or more contact or non-contact obstruction sensing devices, in compliance with UL325 requirements for this installation.  |
| _____     | _____    | 4. The slide gate has been screened or secured from the bottom of the gate to a minimum of 48 inches above ground to prevent a 2 1/4-inch sphere from passing through the openings anywhere in the gate and in that portion of the adjacent fence that the gate covers when the gate is in the open and closed positions. Picket gates which have spacings less than 2 1/4 inches apart to the minimum height requirement are also acceptable. |
| _____     | _____    | 5. Roller covers have been installed on cantilever gates.  |
| _____     | _____    | 6. Pedestrians have been supplied with a separate access opening. The customer has been informed that <u>all pedestrian traffic must use the pedestrian gate</u> .   |
| _____     | _____    | 7. Two (2) warning signs have been installed, one on each side of the gate in easily visible locations. The customer has been informed that these signs must remain at all times.  |
| _____     | _____    | 8. Controls intended for user activation are located at least six feet (6') 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 have a security feature to prevent unauthorized use.  |
| _____     | _____    | 9. The installer has properly adjusted the obstruction sensing feature and has tested the gate to make sure that the gate stops and reverses a short distance with minimal resistance applied (40 lbs. on a swing gate at the end of the gate, 75 lbs. on a slide gate)  |
| _____     | _____    | 10. The installer has instructed the customer in the proper use of the gate operator and reviewed all of the operational functions, obstruction sensing devices, warning beeper and reset, etc.  |
| _____     | _____    | 11. The installer has instructed the customer in the proper use of the operator's manual disconnect feature. The manual disconnect must never be used while the gate is in motion. The power switch must be turned off before using the manual disconnect and disengaging the operator.  |
| _____     | _____    | 12. The installer has reviewed all safety instructions with the customer, and has left the safety instructions and owner's information sheets for their reference.   |
| _____     | _____    | 13. The installer has answered any questions the customer has regarding the operation of the gate operator and gate operator safety precautions.   |
| _____     | _____    | 14. The installer has explained to the customer that a regular maintenance schedule for both the gate and the gate operator is recommended.  |

By signing this installation checklist, I/we hereby certify that each item listed and checked above has been covered by the installer and is clearly understood by the customer.

\_\_\_\_\_  
Customer Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Installer Signature

\_\_\_\_\_  
Date



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# Installation & Operation Manual

Vertical Pivot Gate (VPG) System

## VPG Operator-24 (LM)

This product is to be installed and serviced by a trained Gate Systems Technician only. Contact AutoGate for a local professional in your area.

Before attempting to install, operate or maintain the operator, you **MUST** read and fully understand this manual and follow all safety instructions.

# Safety & Helpful Information

AutoGate and the industry has endorsed three voluntary safety standards related to automatically operated gate systems. In the United States, UL 325 addresses the manufacturing and installation of gate openers and in Canada the standard is CSA 22.2 no. 247-14. ASTM F2200 addresses the design and construction of gates for vehicular traffic that are to be automated.

**UL 325:** Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems. For obtaining a copy of this standard call Underwriters Laboratory at 1-888-853-3503 or order online at [www.comm-2000.com](http://www.comm-2000.com)

**CAN/CSA 22.2 no. 247-14:** Standard for Operators and systems of Doors, Gates, Draperies and Louvres. For obtaining a copy of this standard call CSA at 1-800-463-6727, email at [sales@csagroup.org](mailto:sales@csagroup.org), or order online at [www.http://shop.csa.ca/](http://shop.csa.ca/)

**ASTM F2200:** Standard Specification for Automated Vehicular Gate Construction. For obtaining a copy of this standard contact ASTM at 1-877-909-2786, email at [service@astm.org](mailto:service@astm.org) or order online at [www.ASTM.org/](http://www.ASTM.org/).

Automatic vehicular gate operating systems provide convenience and security to the end user. A gate operator is capable of producing high levels of force to move and or reverse gates. If a system is not properly specified, installed, used, and maintained, serious injuries or death can result to someone in the vicinity of a moving gate. Some situations that can lead to a possibility of serious injuries or death include:

- absence of separate pedestrian access (automatic gates are for vehicular traffic only)
- reaching through a gate to operate the system
- attempting to climb under, over, or through a gate or the area covered by the travel of the gate
- children playing on, or in the vicinity of, the gate
- Improperly installed or physical failure of gate supporting hardware, which may allow a gate to “over travel” or fall down or fall from its prescribed mounting position
- unsafe gate designs and/or an absence of required entrapment protection devices
- unsafe installations in which access control devices or pedestrian access areas have been located within reach of or contacted by any part at any time by the moving gate
- modifying a manufacturers design or components and failing to follow instructions
- untrained individuals attempting to adjust, repair, or perform maintenance on a gate system

## **General Requirements from these standards (include, but are not limited to the following;)**

1. Gates shall have smooth bottom edges, with vertical bottom edged protrusions not exceeding 1/2” (0.50 in. /12.7 mm) other than the exceptions listed in ASTM F2200.
2. The minimum height for barbed tape shall not be less than eight foot (8') (2.44 m) above grade.
3. The minimum height for barbed wire shall not be less than six foot (6') (1.83 m) above grade.
4. Protrusions shall not be permitted on any gate. Refer to ASTM F2200 for exceptions



5. Gates shall be designed, constructed and installed such that their movement shall not be initiated by gravity when an automatic operator is disconnected from it's supporting or drive system hardware. A vehicular vertical pivot gate shall be restrained from movement along the arc of its path of travel.

6. The following provisions shall apply to Class I, Class II, and Class III vehicular vertical pivot gates:

All areas of the moving gate panel from the bottom of the gate to the top of the gate or a minimum of 72 in. (1.83 m) above grade, whichever is less, that pass by a fixed stationary object, and in the area of the adjacent fence that the gate covers during the travel of the gate, shall be designed, guarded or screened to prevent a 2 1/4 in. (57 mm) diameter sphere from passing through such areas. A gap, measured in the horizontal plane parallel to the roadway, between a fixed stationary object nearest the roadway (such as a gate support post) and the gate frame when the gate is in either the fully open position or the fully closed position on vertical pivot installations, shall not exceed four (4) inches (102 mm). Exception: All other fixed stationary objects greater than 16 inches (406 mm) from the gate frame shall not be required to comply with this section. Horizontal and vertical framing members of a gate shall be smooth, and shall not include protrusions other than gate hardware to a maximum of 1/2" (0.50 in. /12.7 mm). All gates shall be designed with sufficient lateral stability to assure that the gate will enter a receiver guide.

7. Class IV vehicular vertical pivot gates shall be designed, constructed and installed in accordance with security related parameters specific to the application in question.

8. Controls intended for user activation must be located at least six feet (6') 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. Exception: Emergency access controls only accessible by authorized personnel (e.g. fire, police, EMS) may be placed at any location in the line-of-sight of the gate.

9. A minimum of four (4) WARNING SIGNS shall be installed, two on each side of the gate where easily visible when the gate is open or closed.

10. A vehicular gate operator or vehicular drop arm operator shall have provisions for, or be supplied with, at least two (2) independent monitored entrapment protection means as specified in UL 325 Table 31.1 for each entrapment zone. At installation, both entrapment protection devices must be installed.

| Vertical Pivot Gate Systems  |  |
|--|--|
| Operator Entrapment Protection Types   |  |
| Type A   | Inherent entrapment protection system (built into the control board) |
| Type B1  | Non-contact sensors such as photoelectric sensor (Photo Beam)        |
| Type B2  | Contact sensors such as edge sensors                                 |
| <p><b>Note</b> – The same type of device shall not be utilized for both entrapment protection means. Use of a single device to cover both the opening and closing directions is in accordance with the requirement; however, a single device is not required to cover both directions. A combination of one Type B1 for one direction and one Type B2 for the other direction is the equivalent of one device for the purpose of complying with the requirements of either entrapment protection means. This operator is provided with Type A built into the control board. The installer is required to install additional entrapment protection devices in each entrapment zone.</p> |  |

# **END USER / INSTALLER CHECK OFF LIST**

**IT IS RECOMMENDED THAT EACH ITEM ON THIS INSTALLATION CHECKOFF LIST  
BE DISCUSSED WITH THE END USER.**

- \_\_\_ FOUR WARNING SIGNS SECURELY INSTALLED, TWO ON EACH SIDE OF GATE VISABLE IN BOTH OPEN AND CLOSED POSTION. (REQUIRED)
- \_\_\_ TWO MEANS OF ENTRAPMENT PROTECTION ARE INSTALLED TO REVERSE THE GATE IN THE CLOSING DIRECTION (i.e. PHOTO BEAM, CONTACT SENSOR OR TYPE A CURRENT SENSING PER UL 325—6TH EDITION (REQUIRED)
- \_\_\_ OTHER ENTRAPMENT RISKS IN THE GATE TRAVEL AREA HAVE BEEN PROTECTED PER ASTM F-2200 (i.e. SCREENING, FENCING, ETC.) ( REQUIRED)
- \_\_\_ CUSTOMER ADVISED THAT GATE IS FOR VEHICULAR TRAFFIC ONLY. (REQUIRED)
- \_\_\_ A SEPARATE PEDESTRIAN ENTRY AND/OR EXIT IS PROVIDED. (REQUIRED)
- \_\_\_ GATE GUARD/FENCED OFF AREA INSTALLED ON BACK SIDE OF OPERATOR. (REQUIRED)
- \_\_\_ KICK PLATE INSTALLED ON DOOR SIDE OF OPERATOR. (REQUIRED)
- \_\_\_ ALL ACCESS CONTROL DEVICES A MINIMUM OF SIX FOOT (6') AWAY FROM THE MOVING GATE PANEL. (REQUIRED)
- \_\_\_ CLASS OF OPERATOR IS APPROVED FOR THE APPLICATION OF THE OPERATOR (CLASS 1,2,3,4) (REQUIRED)
- \_\_\_ CONTROLS INTENDED TO RESET GATE AFTER BEING OBSTRUCTED ARE INSTALLED IN LINE OF SIGHT (REQUIRED)
- \_\_\_ FIELD WIRING SECURED TO AVOID PINCHING DAMAGE.
- \_\_\_ CUSTOMER INSTRUCTED AND IS CLEAR ON PROPER USE OF GATE OPERATOR. (REQUIRED)
- \_\_\_ CUSTOMER INSTRUCTED ON PROPER USE OF ALL CONTROL DEVICES USED WITH OPERATOR.
- \_\_\_ SAFETY INSTRUCTIONS WERE REVIEWED AND LEFT WITH CUSTOMER. (REQUIRED)
- \_\_\_ DISCUSS THE POTENTIAL FOR A PREVENTATIVE SERVICE AND MAINTENANCE CONTRACT.
- \_\_\_ A PHOTO OF COMPLETED INSTALLATION TAKEN FROM FRONT AND BACK OF GATE & DATED.
- \_\_\_ CUSTOMER TRAINED ON MANUAL OPERATION OF THE GATE.
- \_\_\_ CUSTOMER ADVISED NOT TO DISCONNECT THE UL 325 ENTRAPMENT ALARM IN ANY WAY
- \_\_\_ ALL ENTRAPMENT PROTECTION MEANS HAVE BEEN TESTED AND VERIFIED FOR PROPER OPERATION

***THIS GATE OPERATOR IS INSTALLED FOR USE AS A CLASS \_\_\_\_\_ INSTALLATION.***

## **Operator Class Designation**

**CLASS I** - RESIDENTIAL VEHICULAR GATE OPERATOR – A vehicular gate operator (or system) intended for use in garages or parking areas associated with a residence of one to four single families.

**CLASS II** – COMMERCIAL/GENERAL ACCESS VEHICULAR GATE OPERATOR – A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units), hotel, garages, retail store or other buildings accessible by or servicing the general public.

**CLASS III** – INDUSTRIAL/LIMITED ACCESS VEHICULAR GATE OPERATOR – A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not accessible by or intended to service the general public.

**CLASS IV** - RESTRICTED ACCESS VEHICULAR GATE OPERATOR – A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

**IT IS RECOMMENDED THAT END USER & INSTALLER**

**MUST RETAIN A COPY OF THIS CHECK OFF LIST FOR THEIR RECORDS**

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# WARNING!

**TO REDUCE THE RISK OF INJURY OR DEATH, READ AND FOLLOW ALL INSTRUCTIONS!**

## REDUCE RISK

1. Follow the safety standards of the Occupational Safety and Health Administration (OSHA), as well as any applicable Federal, State, Local Project Specification and Industry Standards or Procedures.
2. Only experienced personnel are to install, operate and maintain the equipment. Serious injury or equipment damage can occur if installed or operated by untrained personnel. Operators of the equipment must follow the specific instructions and safety precautions located in this manual.
3. At NO time should the Gate Panel/Drop Arm be modified in any way.
4. Do not add any additional weight to the Gate Panel/Drop Arm without contacting AutoGate first. This can affect the balancing and operation of the system.
5. Always keep people and objects away from all moving parts and entrapment/pinch points of the system. **NO PERSON OR OBJECT SHOULD CROSS THE PATH OF THE MOVING GATE.**
6. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors or contact sensor. Sensitivity is adjusted at the "OC" or "CC" programming function. Failure to adjust and reset the gate operator properly can increase the risk of injury or death.
7. Use the belt tension lever release only when the gate panel/drop arm is not moving and powdered down.
8. Install the vehicular gate operator only when the operator is appropriate for the construction of the gate panel/drop arm and the usage class of the gate.
9. The system is intended for only gates used for vehicles. ***Pedestrians MUST be supplied with a separate access opening.*** The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate panel/drop arm such that persons will not come in contact with the vehicular gate panel/drop arm during the entire path of travel of the vehicular gate panel/drop arm.
10. The gate must be installed in a location so that enough clearance is maintained between the gate and adjacent structures when opening and closing to reduce the risk of entrapment.
11. Check the area where the gate will be installed and operated for overhead wires, limbs, buildings, signs or any other fixed objects that may interfere with the gate travel.
12. Controls intended for user activation must be located at least six feet (6') away from any moving part of the gate panel/drop arm and where the user is prevented from reaching over, under, around or through the gate panel/drop arm to operate the controls.

## SAVE THESE INSTRUCTIONS

Automatic Gate Operators can produce high levels of force, therefore, it is very important that all gate operator system installers and designers are fully aware of potential hazards that exist with an incorrectly installed or designed system. The internal safety capabilities of a gate operator system are not enough to reduce the risk of injury. The operator is only one part of a properly installed system which when combined with all ASTM F2200 requirements and correctly installed approved entrapment devices will yield a completed UL 325, 6th ed. and CSA 22.2 NO. 247-14 listed system that will not only provide convenience and security, but will be safer with a minimal risk of injury. The following information contained in this manual along with the installation checklist provided will make you aware of potential areas that are of a safety concern. Disregarding any of the following may result in **SERIOUS INJURY OR DEATH!**

# **SAFETY INSTRUCTIONS REGARDING PRIMARY & SECONDARY**

## **ENTRAPMENT PROTECTION**

This unit is equipped with one (1) INTERNAL means of entrapment protection. (SEE UL 325 SECTION 30A) Gate Operator shall provide one (1) INTERNAL (INHERENT) AND one (1) EXTERNAL entrapment feature.

### **INTERNAL:**

(TYPE A) – Inherent entrapment sensing systems – operator will reverse direction when the inherent TYPE A device senses an obstruction.

### **EXTERNAL:**

(TYPE B1) – Provision for connection of a non-contact sensor (Photoelectric or equivalent)

(TYPE B2)— Provision for connection of a contact sensor (Edge device or equivalent).

**NOTE:** Unit ships with S1-6 ON & S1-8 OFF. DO NOT change these settings (see page 12 for illustration).

### **PRIMARY PROTECTION- TYPE A INHERENT PROTECTION:**

The unit will reverse direction when an obstruction is sensed while moving either direction. Sensitivity is adjusted at the IRD1 on the control board while closing. If an obstruction is sensed by the primary inherent sensor, the gate will reverse and open to the full open position. The gate will remain open until a close command is received or will close by timer (if activated) after a new input is received. In order for the gate to close by timer, a new input on the terminals J5-1-8 must be given. If an input is still present when the gate HAS reached the full open position, this input will need to be renewed or removed and another input given before the close timer will close the gate.

### **ENTRAPMENT ALARM:**

Will activate upon the primary inherent sensor sensing a second obstruction before reaching a limit switch. Once activated, the gate will remain at rest and an alarm will sound. The alarm can only be cleared by an input applied to J5#4. The wiring used to reset the operator **MUST** be in the line of sight and **MUST** be an “INTENDED” reset. Access control devices of any kind that require an intended activation may be used for this reset. Devices that will cause an incidental reset should not be used, these include; vehicle detectors, probes, timers, motion sensors, photo beams. Turning off the DC battery power **AND** turning off the AC power at the GFCI service outlet will also reset the control board.

## **WARNING!**

**FAILURE TO COMPLY WITH THIS REQUIREMENT MAY RESULT**  
**IN SERIOUS INJURY OR DEATH**

### **APPROVED SECONDARY ENTRAPMENT DEVICES**

#### **PHOTO BEAMS**

1)EMX INDUSTRIES  
2)ALLEN BRADLEY  
3)OMRON / MMTC

MODEL#: IRB-325  
MODEL#: 60-2728  
MODEL#: E3K-R10K4-NR

TRANSMITTER / RECEIVER TYPE  
RETRO-REFLECTIVE TYPE  
RETRO-REFLECTIVE TYPE

#### **REVERSING EDGES (CONTACT EDGES)**

MILLER EDGE      MODEL— ME-120



## WARNING!

TO REDUCE THE RISK OF INJURY OR DEATH, READ AND FOLLOW ALL INSTRUCTIONS!

### SAFETY INSTRUCTIONS FOR INSTALLER AND END USER

Proper design is important in your system layout and installation. Entrapment devices must be used at all available points where injury or property damage may occur. For protection from injury to persons, use approved Entrapment devices across the driveway. Reversing Loops (Vehicle Detectors) should be installed in front and behind the gate to provide a reverse signal or stop signal to the gate operator. All reversing devices should be tested and inspected monthly. If a Reversing Loop or Loop detector malfunction, operator should be disabled until repair can be made by an experienced service company.

In providing the service of “designer” or “installer” of the operator and gate system, you are responsible for educating the **END USER** on proper and safe operation of the gate system. All precautions to eliminate hazards **MUST** be taken before the system can be put into operation. All identified entrapment areas are required to be protected against entrapment. Refer to ASTM F2200 for diagrams of common entrapment areas.

- Check the National, State & Local building and fire codes **BEFORE** installation
- If you did not order a **Reversing Edge** (for along the bottom rail of your gate), or an **Infra-Red Modulated Photocell** (Reversing Beam), you will **NOT** be in compliance with March 2000 UL 325 Code, Rev 5. Consult your dealer for additional information.
- Pedestrians **must** use a separate entrance/exit and **never** the vehicular entrance/exit gate.
- **NEVER** activate the gate from long distances where visibility of the gate cannot be seen. Anyone operating the gate should always operate it in a safe manner.
- **NEVER** allow children or anyone to play on or around the gate at any time.
- **DO NOT** affix any adhesive material within 30 days of receiving the system.
- **DO NOT** attach anything to the gate over four (4) pounds total weight or four (4) square feet without consulting AutoGate for re-balancing instructions. **The gate must remain balanced to ensure safe and reliable operation.**
- The gate and operator are designed to work together. **DO NOT** attempt to install an unauthorized gate without AutoGate’s prior authorization and instructions, doing so may VOID the operator warranty.
- **DO NOT ALLOW** any access control devices to be mounted within 6 feet of the moving gate or in such a way that someone could reach their hand or arm through the gate to activate it.

## WARNING!

THE GATE OPERATOR IS DESIGNED AND FACTORY BALANCED FOR THE SPECIFIC GATE IT WAS SUPPLIED WITH.

DO NOT MODIFY THE GATE IN ANY WAY OR ADD SIGNS WEIGHING MORE THAN 4 LBS TOTAL OR FOUR (4') SQUARE FT.

FAILURE TO COMPLY WITH THIS REQUIREMENT WILL VOID THE WARRANTY AND MAY RESULT IN SERIOUS INJURY OR DEATH.

# ORIENTATION

The *AutoGate Vertical Pivot Gate (VPG)* in this manual you will see it referred to as “system”. The VPG has many features that make it effective, reliable, and easy to use, and some of these important features are summarized in the table below. Note that not all systems are identical as width, gate panel implementation, finish, accessories such as lights, and other accessory component options vary order to order. Below are some key features to the System.

| Feature                                   | Explanation   |
|---|---|
| All Electric Operation.<br>NO HYDRAULICS! | 24 volt DC with input voltage of 120-volt (standard) or 240-volt single phase. Built-in battery backup for continued operation during power outages. Can be outfitted with solar charging for remote locations without AC power. No hydraulic fluids (for environmentally sensitive areas). Batteries are not included, but are |
| Gate Panel Options                        | Ranging from highly decorative pickets to a simple chain link or industrial anti-climb panels for military or correctional facilities.  |
| Opens Completely                          | The VPG opens fully to 90°. Easily accommodates tall vehicles and equipment.  |
| Duty Cycle: Continuous                    | The operator is engineered and rated for continuous duty and is specifically designed for constant use throughout the day.  |
| Low Maintenance                           | Requires only periodic lubrication and annual tension adjustment. Very low order of service required compared to our competition.   |

## **GLOSSARY & TERMS**

Figure 1.1 through 1.3 will orient you to the basic components of the system. Most of the terms are self explanatory; however, the following will help you understand certain components and terms.

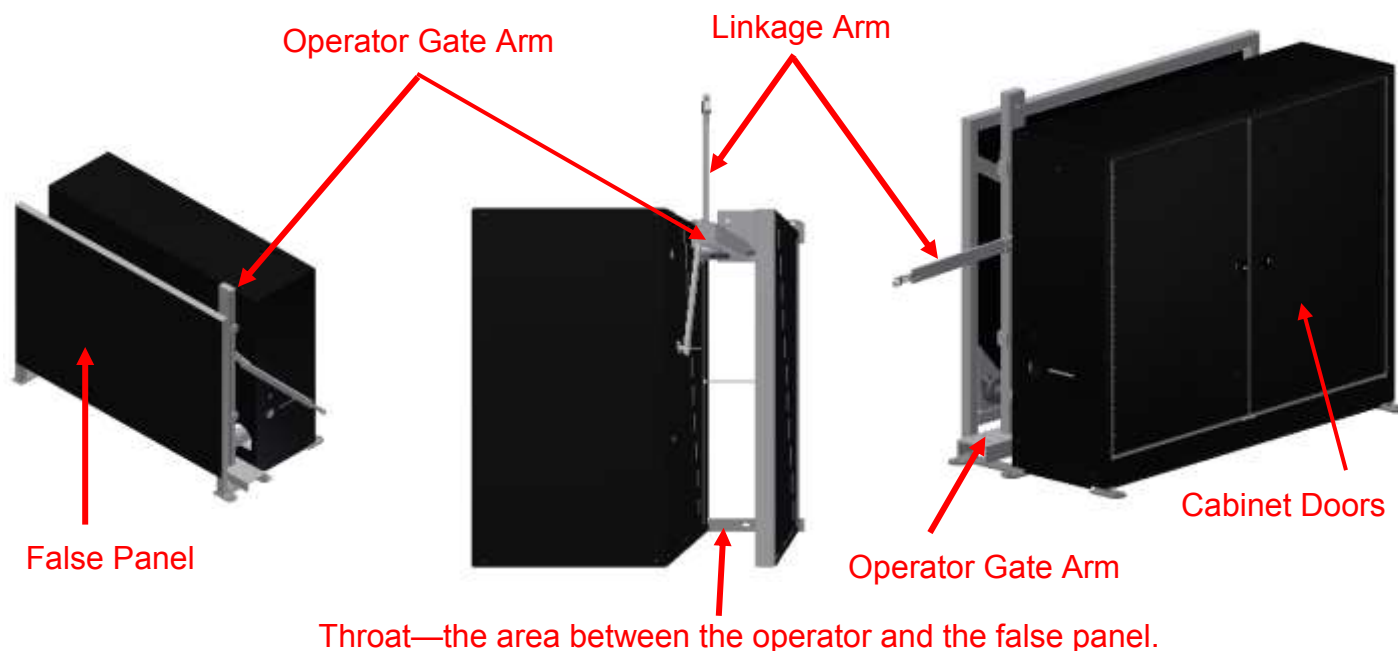
**Operator** - A mechanical device used to open and close (raise and lower) a gate panel/drop arm system.

**False Panel** - Parallel to operator enclosure is the *False Panel*. It is permanently attached to the operator and is comprised of two (2”) inch steel tubing and sheet metal. Its purpose is to protect pedestrian, technician, and system users from being in the area of the pivoting gate panel/drop arm.

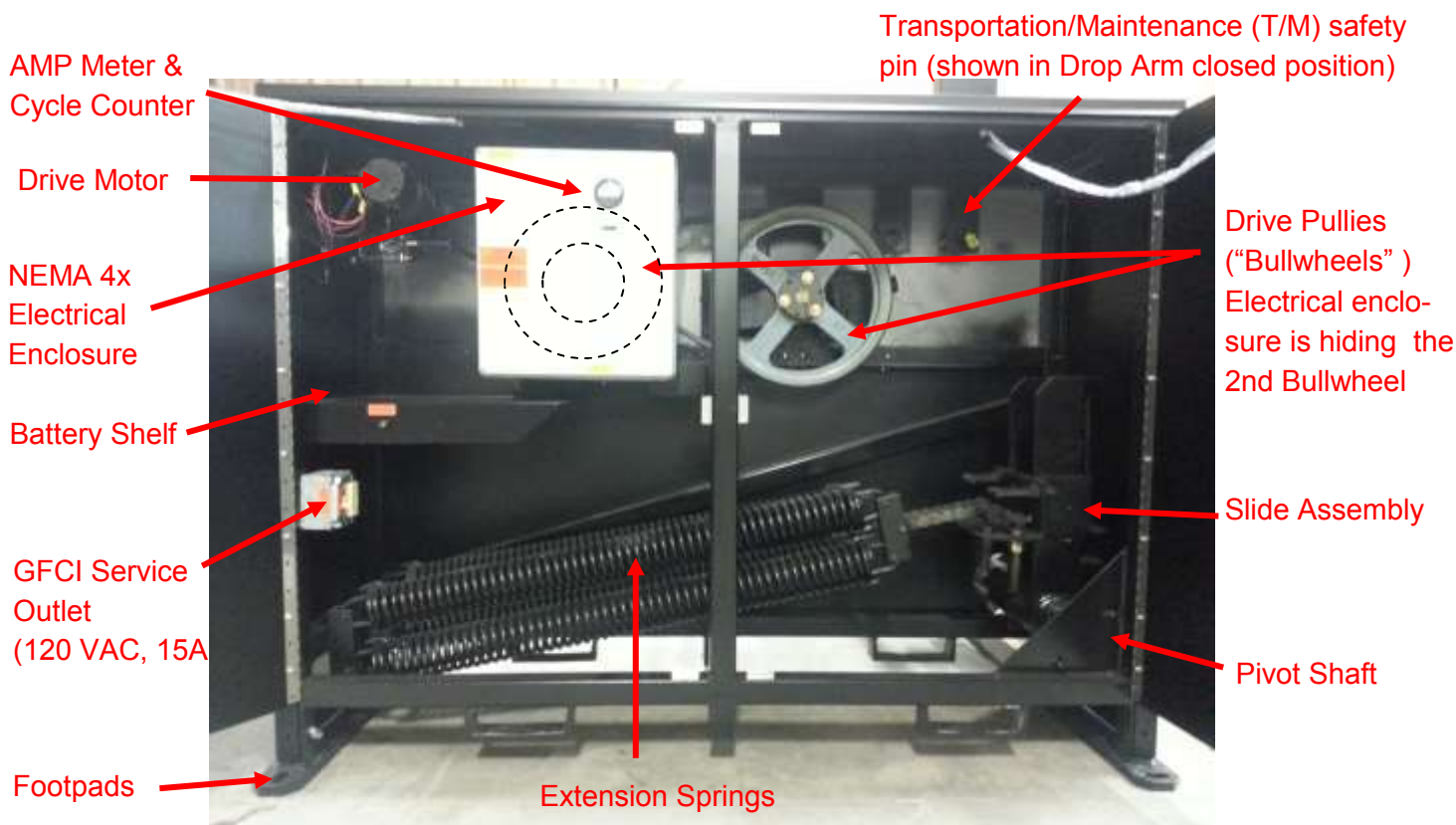
**Hand (or handing)** - The system comes in left hand or right hand configurations. This refers to the location of the operator when viewed from the secured side of the closed Gate. To illustrate “handing” see the figure 1.1 for an example of a Right Handed (RH) system.

All of the operator's mechanical and electrical components are housed inside the operator (See Figure 1.2 through Figure 1.4). The operator is a lockable steel cabinet that mounts on a raised concrete pad. A separate NEMA 4x electrical enclosure is also housed inside the operator. The electrical enclosure contains the master control circuit board and the terminal blocks/wire management system. It may also house a variety of optional electrical components and configuration custom to your specific order.

**Figure 1.1 Operator (not depicting Drop Arm or optional gate panel)**



**Figure 1.2 Components Housed in the Operator (Picture may not depict exact items)**



## Electrical Enclosure

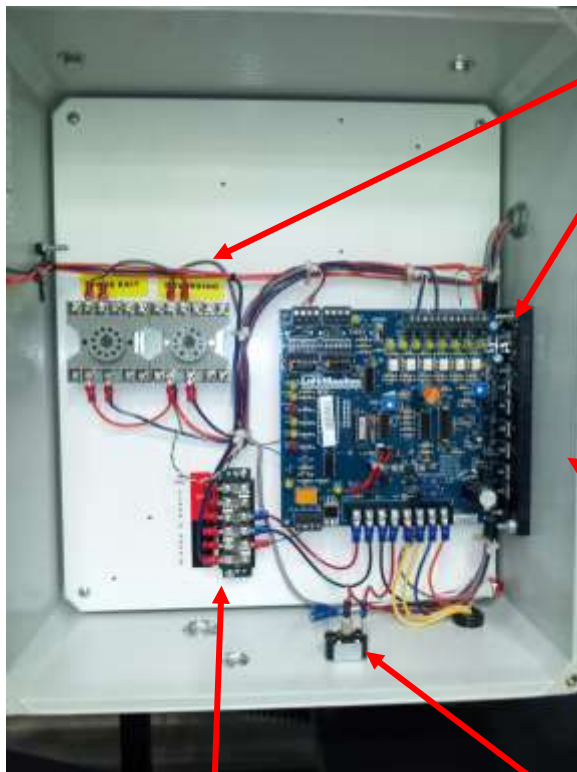
The control board is configured to receive input commands from nearly any type of access control device such as a card reader, keypad, push button panel, vehicular loop detector, over-speed detector, or even a PLC. In short, the control board accepts dry contact inputs to provide the necessary open, close, or reversing commands to the board. The control board also has a built in battery charging system to maintain proper back-up battery voltage for hundreds of cycles in the event of a power outage.

The system can also be configured to operate: 1, 2 or 3 color traffic lights, audible alarm devices, external emergency shut-off switch, output to an external source to indicate gate open/closed, and several other configurations including **LED** warning lights on the Gate Panel/Drop Arm.

Pre-installed amp meter and cycle counters are a standard on all systems from AutoGate with the Liftmaster Control Board..

AutoGate mounts the Liftmaster Control Board in a NEMA 4X Electrical enclosure box.

**Figure 1.3 Electrical Enclosure (Inside)**



1 AMP MAX 24 VDC  
Accessory Power Strip

DC/Battery  
Power Toggle Switch

Loop Detector Sockets (Free Exit & Reversing)

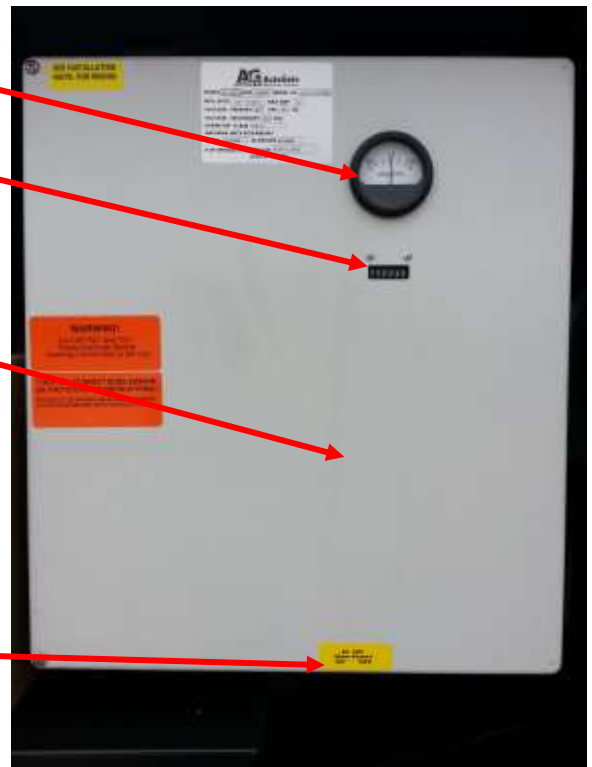
Liftmaster  
Control Board

Amp Meter

Cycle Counter

NEMA 4x  
Enclosure

**Figure 1.4 Electrical Enclosure (Outside)**



# PREPARATIONS PRIOR TO INSTALLATION

## T/M (Transportation & Maintenance) Safety Pin Warning!

When you receive your system, it has a safety device called a T/M Safety Pin installed (see Figures 2.1-2.3 below). T/M stands for Transportation and Maintenance because the pin must be installed during shipping, installation, and whenever maintenance is being performed. Do not remove this pin until the instructions in this manual direct you to do so!

FIGURE 2.1



Springs Are Under High Tension!—**CAUTION!!**

Figure 2.2

T/M Pin viewed from inside the operator



Figure 2.3

T/M Pin viewed in the operator throat Area (Door Keys are attached here for shipping)



## SITE PREPARATION & PLANNING

Inspect the site and verify there are no underground utilities, overhead wires, or other obstructions that can affect your installation and use. Keep routine foot traffic away from the system to reduce the chance of pedestrians or site personnel contact with a moving system. A separate pedestrian gate or turnstile is highly recommended to discourage the use of the system by anything other than vehicular traffic.

Determine if there are any accessory components to be installed with your system and necessary conduit used for traffic lights, in-ground loops, access control stations, etc. and factor them into your site layout and installation plan.

High voltage and control wiring must **NOT** be run in the same conduit.

### Concrete Pads

Concrete pads are required to install the VP Operator & Yoke. Along with securing the operator to the entry / exit point, the pad provides a fixed and adequate foundation to resist wind and maintain stability for many years of operation. Prior to pouring the concrete for the operator pad ensure the soil is undisturbed or compacted to local or governing standards. (See DWG. 102-P)

### 4' X 7' Operator Pad Options:

1. Full Pad, Minimum depth of 36" or below *local* frost line
2. 10"-12" thick pad with five (5) 12" dia. x 36" deep holes or below *local* frost line

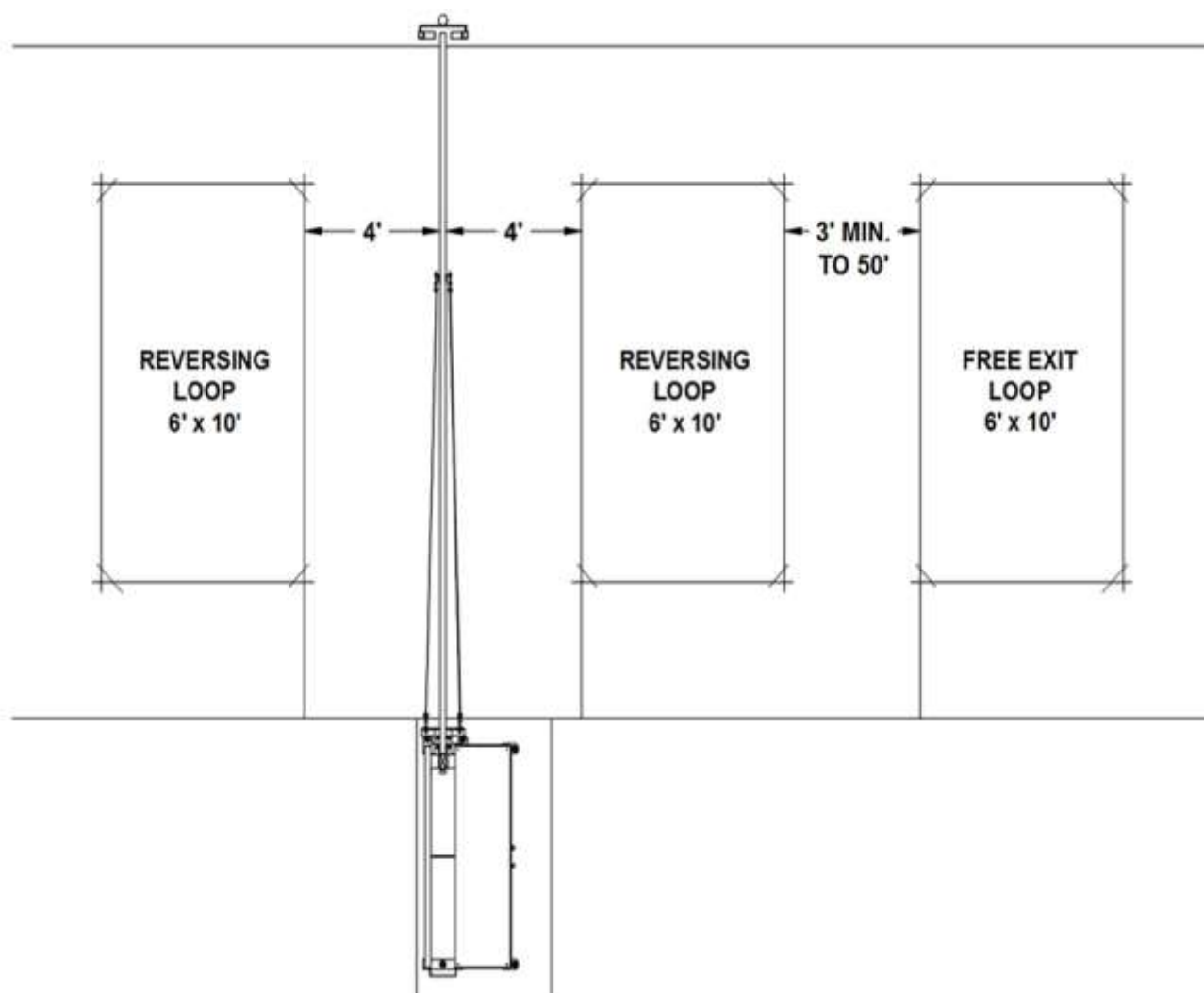


## **Vehicle Loop Installation and Performance**

Ground vehicle sensing loops are very common to gate sites. They are used for the detection of vehicles which then triggers the gate to do a specific action. Proper installation and placement is critical. If you purchased Pre-formed Loops carefully follow the enclosed installation instructions and use the diagram below for the proper placement of the ground loops. If you are constructing the loops on-site, be certain to use D.O.T. approved materials and methods.

Test the function of the loops thoroughly by using vehicles once installed to verify correct operation.

**Figure 2.4**



# PREPARATIONS PRIOR TO INSTALLATION

## RECOMMENDED TOOLS AND EQUIPMENT

|                                    |  |
|------------------------------------|--|
| Lifting Strap                      | Multi-Meter (DCV & AMPS)                                 |
| Hammer & Level                     | Hammer Drill, 1/2 & 5/8 Bits                             |
| Grease Gun, Lithium Grease         | Tape Measure   |
| Screwdriver Sets (Flat & Phillips) | 1/2" Drive Socket Set: 1/2", 9/16", 3/4", 15/16", 1-1/8" |
| Electrical Tape                    | Open End Wrenches: 1/2", 9/16", 3/4", 15/16", 1-5/16"    |
| Wire Cutters/Strippers             | Misc. Electrical Connectors                              |
| Chalk Line                         | Batteries (2) 12 VDC Group 24 Deep cycle marine          |

**NOTE:** Refer to manufacturer's instructions of Accessory Equipment for correct wire size and type.

## RECEIVING & UNLOADING INSTRUCTIONS

Unloading & Unpacking - Gate weight per foot varies with gate style & height and are approximate. Operator weighs 1150 lbs., steel gates are 24 lbs. per foot and aluminum gates weigh 19 lbs. per foot.

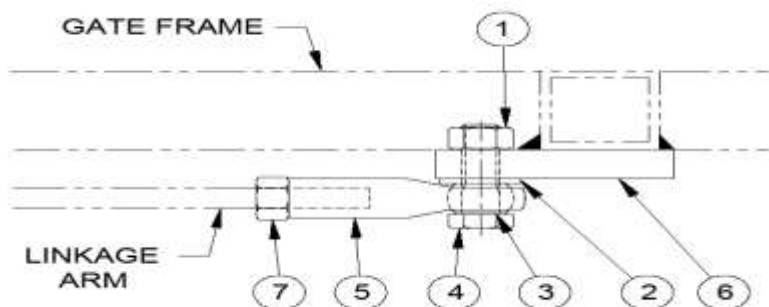
1. Have adequate equipment ready to unload your Gate and Operator safely. Utilize a Liftgate service when available from the LTL carrier.
2. Before removing your Gate and Operator from the truck, inspect it for any visible damage and make sure the Gate Box was shipped upright. **(DO NOT DROP EITHER GATE OR OPERATOR BOX)**. Photograph and retain if damaged as well.
3. After uncrating your Operator, locate and remove the door lock keys attached to the Transport/Maintenance (T/M) Safety Pin. **DO NOT REMOVE T/M PIN. ONLY REMOVE HAIR PIN RETAINER TO REMOVE THE KEYS THEN REPLACE HAIRPIN.** (See Figure 2.3)
4. Any transmitter, antenna, or other ordered accessories will be boxed inside your operator cabinet.
5. Unpack gate panel crating very carefully.

# INSTALLATION

## Installing VP Gate and Operator

1. Position Gate on Operator Arm.
2. Use (1) SS 3/4"-10 x 4 1/2" (STEEL GATE) or (1) SS 3/4"-10 x 5" (ALUMINUM GATE) Bolt for the top connection. Use (4) SS 1/2 x 1-1/2" Bolts for the bottom connection.
3. Insert the top bolt first and then the bottom four (4) bolts finger tight. Be certain gate is properly aligned before tightening. Tighten bottom bolts first, then tighten top bolt.
4. Locate washers and Linkage Pivot Bolt (5/8" x 2-1/4") and insert through rod end fitting and tighten bolt into the gate lug hole as shown below. You may have to push down on the gate to insert Linkage Bolt.

**Figure 3.1**



1. 5/8-11 ZINC PLATED FULL HEX NUT
2. 5/8" HEAVY WASHER
3. 5/8" S.S. FLAT WASHER
4. 5/8-11 X 2 1/4" LG. HEX BOLT
5. 5/8" DIA 5/8-18 FEMALE ROD END (TEFLON LINED)
6. 3/4" x 2" x 4" LUG
7. 5/8-18 HEX NUT

## Lifting Gate & Operator

To lift Gate & Operator use a lifting strap. The strap should be secured around Operator Arm and T/M Safety Pin or the top rail of the gate near the operator arm. See Figure 3.2 & 3.3

**Figure 3.2**



**Figure 3.3**



**NOTE:** It is recommended to attach Gate to Operator Arm **before** lifting (for better balance), but it is not mandatory. If using a Forklift to position Operator only, lift from **sides only!** *Do not try to lift gate and operator together from the side*

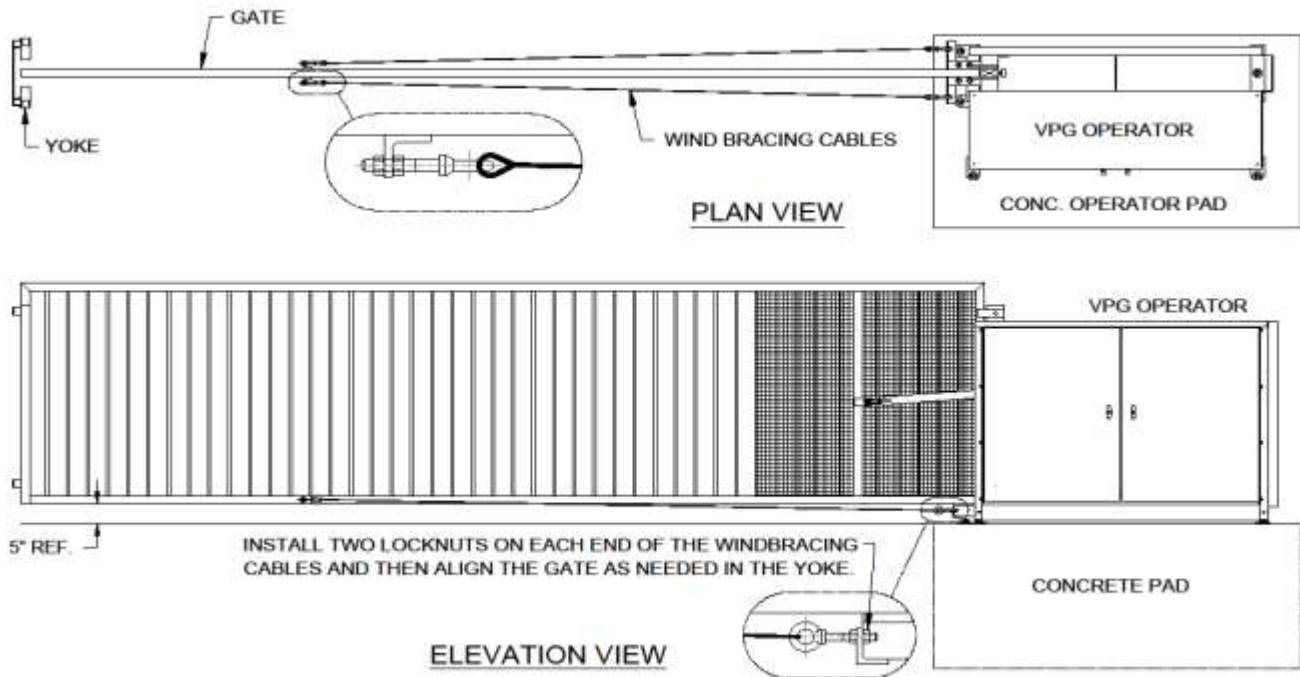
## Positioning Gate Panel/Drop Arm & Operator

Refer to the site drawing for your specific order as there may be details unique to the installation.

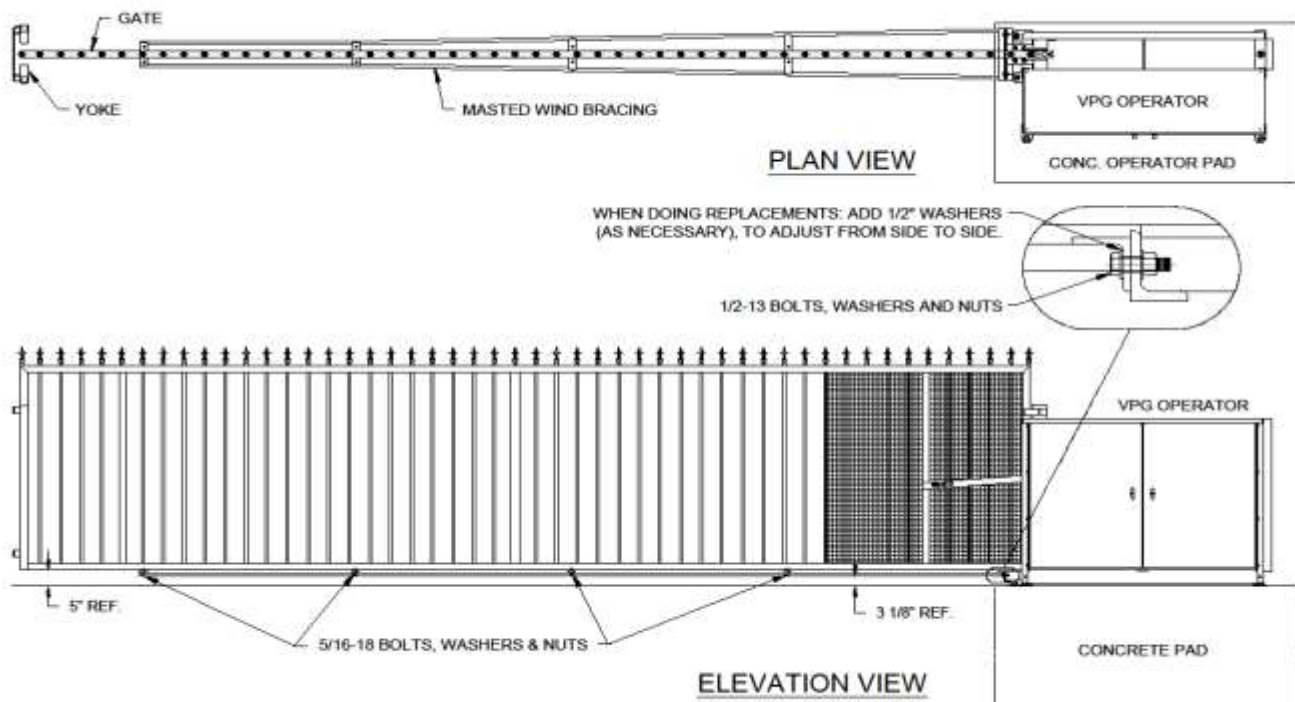
1. Place Gate & Operator Assembly on pad so the end of the Gate is centered over the Yoke pad or intended yoke position for the site (for yoke styles mounted to posts, buildings, etc.). Allow a minimum three (3") inches from edge of pad to bolt holes to prevent concrete damage
2. Position and align Pad Yoke and center under gate.
3. Secure **Operator** with (1) 5/8" dia. Wedge Bolt in rear; check alignment on pad as well as gate panel/Drop Arm alignment before installing remaining anchor bolts.
4. Install remaining four (4) 5 1/2" x 5/8" dia. Concrete Anchor Bolts provided, (**level Gate Panel/Drop Arm and Operator on pad**, if necessary).
5. Secure Yoke with four (4) 1/2" dia. Anchor bolts (provided). If installing a Ground Yoke, allow a minimum space of two (2") inches between bottom of Gate and Yoke.

## Installing Other Components

### Cable Wind Bracing



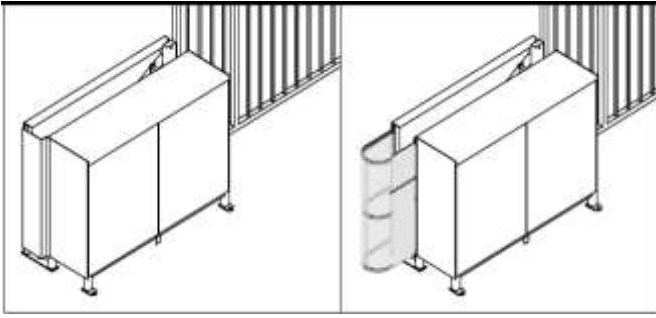
### Masted Wind Bracing



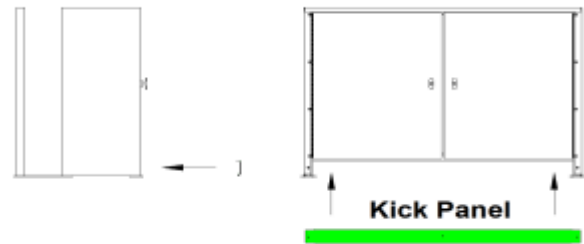


## Installing Other Components

### GATE GUARD



**KICK PANEL:** Attach the Kick Panel to the door side of the operator using the three (3) # 12 x 3/4 TEK screws. See **GREEN** example kick Plate below.



**NOTE:** The area behind the operator is an entrapment zone. The installer must prevent or protect pedestrian access to this area by at least one or more of the following:

- Install factory supplied Gate Guard
- Site installed fencing
- Utilize Recommended Entrapment Protection Devices

### WARNING!

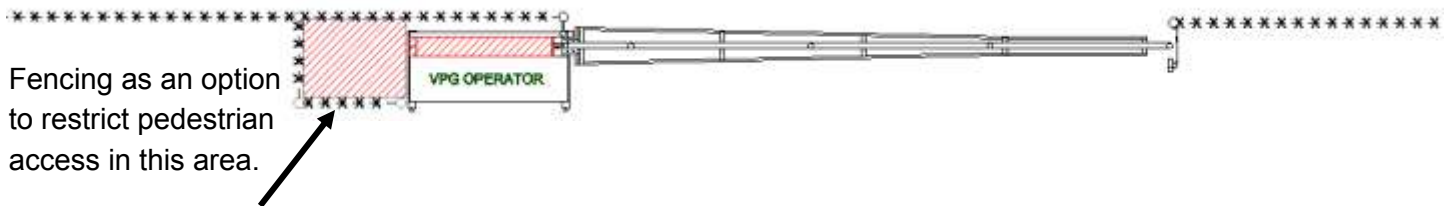
THIS PAGE ILLUSTRATES THE MINIMUM KNOWN ENTRAPMENT ZONES. ANY OTHER ENTRAPMENT ZONES MUST BE MITIGATED BY THE INSTALLER IN ACCORDANCE WITH UL 325 & ASTM F2200 TO REDUCE THE RISK OF PROPERTY DAMAGE, INJURY OR DEATH. THE INSTALLER MUST REDUCE PUBLIC EXPOSURE TO POTENTIAL HAZARDS.

### Entrapment Zones (RED shaded areas)

Fencing

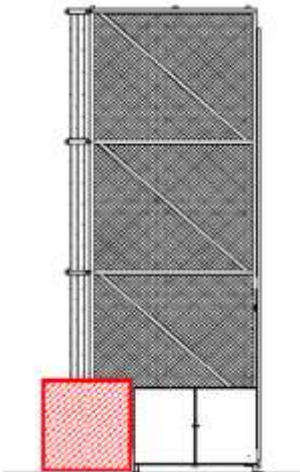
Gate in closed position

Fencing



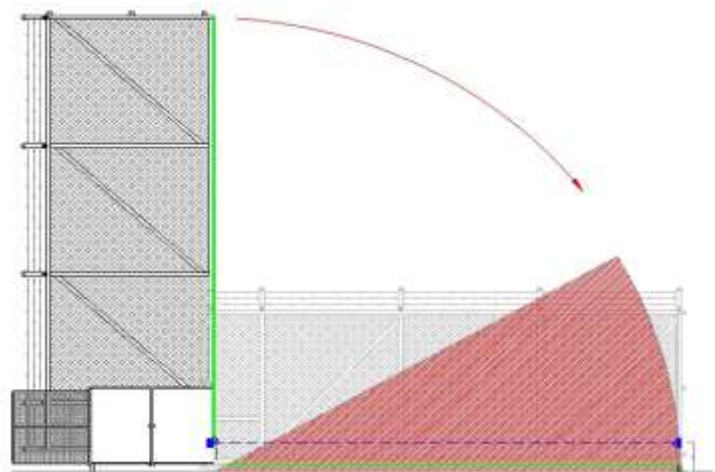
### Opening Entrapment Zones

Gate in "OPEN" position below (shaded area) requires installer to install one (1) of the following: Fencing, installation of provided gate guard, or entrapment protection devices.



### Closing Entrapment Zone

Below illustrates the minimum known entrapment zone when gate is closing. Installation of an approved B1 non-contact sensor (Photo Beam) is shown in **blue** including beam path. Additionally, installation of an approved B2 contact sensor is shown in **bright green**.



## Initial Power Connection & Operator Testing

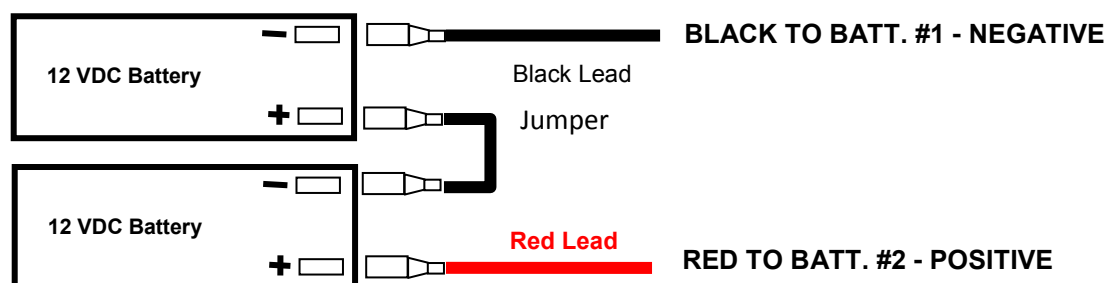
### 1. Connecting Batteries - Required

A. Install two (2) 12 VDC Batteries (**not provided**) on the battery shelf. AutoGate recommends Group 24, 100 Amp hour deep cycle marine batteries for extended battery back up. At a minimum use seven (7) AH batteries for battery back up. See drawing below for proper battery and jumper hook up. **BATTERIES MUST REST IN A LEVEL POSTION ON THE BATTERY TRAY TO AVOID ACID LEAKING FROM BATTERIES.**

B. Install Jumper Wire (provided) from **Battery #1 - POSITIVE** to **Battery #2 - NEGATIVE** (See Below).

C. Locate **RED** and **BLACK** Power Wires and connect:

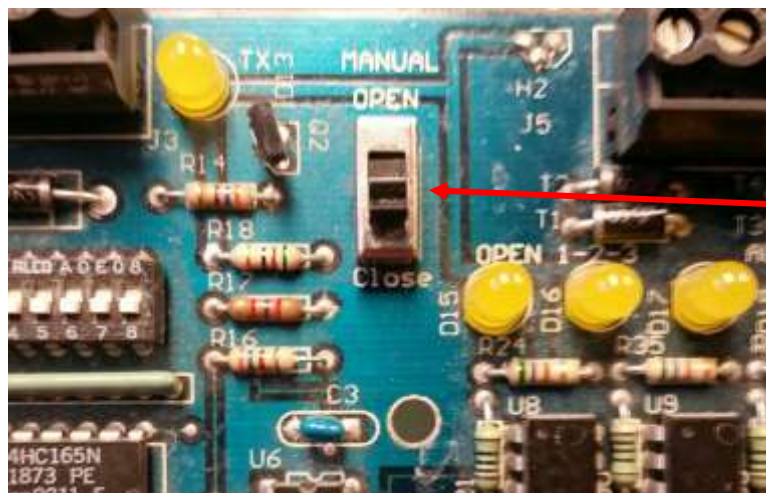
**NOTE:** Battery back up duration will depend on the size of batteries, number of accessories and open/close cycles while being powered by the batteries.



2. Temporarily remove any wires in the main circuit board J5 Strip, Terminal #5 (rev./safety) to disable any Reversing devices not installed from preventing the gate from closing.
3. With all personnel clear of any moving part or component of the system you will take the next steps to cycle the gate up and down a few times to verify proper operation. Turn Main DC Power Switch "on". (Located under the Electrical Enclosure) Use the S3 manual open/close switch on the control board.



**CAUTION:** *At this point you have no external safety devices connected to your operator. Open with care!!*



Use the MANUAL Open-Close switch to test your operator.

### 4. Verify basic operator system function

**NOTE:** The gate should activate and open in approximately 10-12 seconds. In DC only operation the cycle time could vary. If your gate does not lift properly, refer to "Troubleshooting Tips" pages 22—23.

## WARNING!

TO REDUCE THE RISK OF ELECTRICAL SHOCK, THIS EQUIPMENT HAS A GFCI TYPE PLUG THAT HAS A THIRD (GROUNDING) PIN. THIS PLUG WILL ONLY FIT INTO A GROUNDING TYPE OUTLET. IF THE PLUG DOES NOT FIT IN THE OUTLET, CONTACT A QUALIFIED ELECTRICIAN TO INSTALL THE PROPER OUTLET. DO NOT CHANGE THE PLUG IN ANY WAY.

## AC POWER CONNECTION

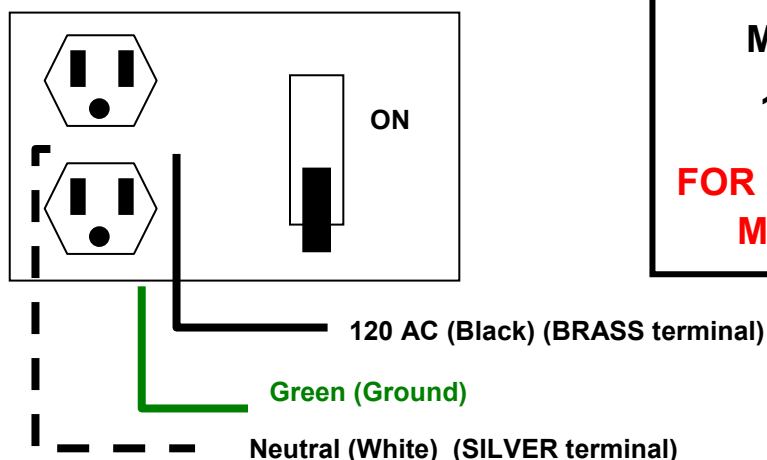
### Connecting AC Power

1. Turn Off DC power.
2. Wire incoming AC power to the 4 x 4 Box provided and turn on the breaker from your AC Source.
3. Turn AC Power Switch on at the 4 x 4 Box.

**NOTE:** The A/C Power must be connected by a qualified, licensed Electrician, according to the [National Electric Code](#), and all State and Local codes. Refer to electrical block diagram for additional information.

#### Pre-Mounted 120 VAC Electrical Outlet & AC Power Switch Electrical Connection

Operator Main AC Power Switch  
(pre-wired to outlet)



#### A/C ELECTRICAL SUPPLY

#### MINIMAL REQUIREMENTS:

120 VAC, 15AMP CIRCUIT

**FOR CLASS 1 APPLICATIONS YOU  
MAY NOT EXCEED 15 AMPS**

## WARNING!

ADDITIONAL 120 VAC SURGE PROTECTION IS RECOMMENDED BUT NOT REQUIRED.  
SURGE UNIT MUST BE GROUNDED TO A TRUE EARTH GROUND.

AC OUTLETS ARE HOT AT ALL TIMES. OUTLETS ARE FOR SERVICE USE ONLY.

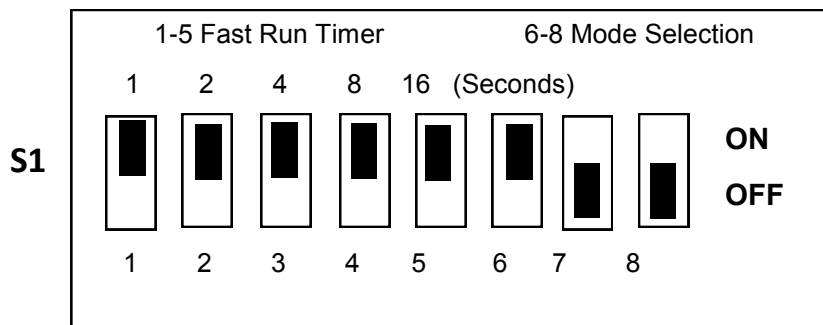
OPERATOR MUST BE GROUNDED TO TRUE EARTH GROUND LUG LOCATED ON FRAME

## CONTROL BOARD

The VP gate has many features and options. Most are controlled by an electronic circuit board inside the Control Box. The circuit board is factory set and should not be altered in any way or the Warranty may be voided. If an adjustment has to be made, consult your Control Board Instructions for details. If you need any further assistance, please contact your local AutoGate Dealer or call AutoGate at 1-800-944-4283.

### Timers and Mode Selections (S1) **SEE DIAGRAM BELOW**

Full Speed Run Timer – Switch Pack S1 (1-5) Switches one (1) through five (5) are FACTORY PRESET. **DO NOT CHANGE!**

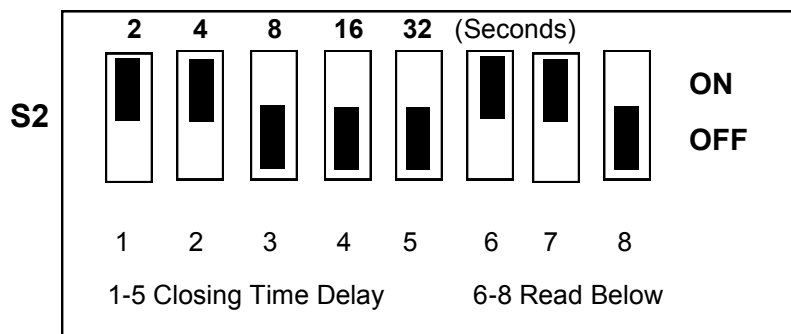


### Mode Selections – Switch Pack S1 (6-8). **SEE DIAGRAM ABOVE**

SWITCH 6 – “On”. This is set for the UL 325 Alarm. **(DO NOT CHANGE!)**

SWITCH 7 - FACTORY PRESET. **(DO NOT CHANGE!)**

SWITCH 8 – “Off” Not used on this system.



### Timers & Mode Selections – Switch Pack S2 (1-8). **SEE DIAGRAM ABOVE**

SWITCHES 1-5 on S2 are for the closing timer delay. Default is S2-3 “ON” to provide a eight (8) second delay if activated. If S2-7 is on, the gate will auto close by timer.

SWITCH 6 – Sets auxiliary. Open input terminal #4 at J5 to be pulse open-pulse close (Default is On).

SWITCH 7 – AUTO CLOSE TIMER – Default is ON. When on, use S2 1-5 to set close time delay. When close timer is selected, you MUST install vehicle and pedestrian detection devices.

SWITCH 8 – AUTO OPEN ON POWER FAILURE – When switch eight (8) is in the ON position, the operator will automatically open the gate approximately 15 seconds after the loss of power. Once power is restored, the operator will resume normal operation. Factory setting is “OFF” allowing the operator to function normally until the battery power has diminished. Once A/C has been restored, the operator will function normally.

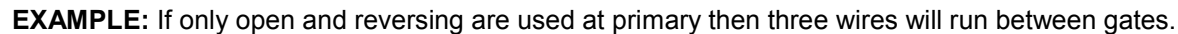
**NOTE:** If batteries were completely discharged, remove from operator and recharge with a commercial grade battery charger.



**INHERENT REVERSE DEVICE (IRD) SHOULD BE TESTED PERIODICALLY TO INSURE PROPER OPERATION.**

The *Instant Reverse Device* is an internal circuit that continuously monitors the motors current for increase draw. This is factory preset for your specific gate size. To test for proper operation, position yourself approximately 2/3 of the way across the driveway. With the gate descending, carefully catch the gate to simulate an obstruction and it should stop and reverse within two (2) seconds. If the gate does not reverse, call the factory for technical assistance. If obstructed while closing, the gate will stop and reverse to the open position, time out (using the time delay set at S2 switches 1-5) and then close. If gate is opening when obstructed, the gate will stop its open travel. If inputs are present, gate will remain stopped. If no inputs are present or existing are cleared, the gate will time out and close.

In a primary/secondary configuration, either unit can be the primary. Choose one unit to be the master and then direct all control wiring to it (also install vehicle detector and receivers in it). At the PRIMARY any input (at J5) with control (detectors, receivers, keypads, timers, etc.) wires to it must also be run to the same terminals of the secondary system. Along with these control wires, both operators **MUST** share a common ground connection from chassis to chassis (or from common to common , i.e. master gate J5 terminal #12 to secondary unit J5 terminal #12).



If it is required that if one gate senses an obstruction, the other reverses also, then three (3) additional wires must be run between the primary **J3** and secondary **J3** as shown below. These connections are for transmitting IRD (obstruction signals) between both units. This will allow the primary or secondary to inform the other that a closing obstruction has occurred and for it to also reverse and open. **SET** switches on **S2, 1-8** the same on both gates.



## SIGNAL CONNECTIONS

THE CONNECTIONS TO THE LEFT MUST BE DONE IN ORDER FOR GATE IRD'S TO WORK CORRECTLY. TERMINAL 1 OF PRIMARY MUST GO TO TERMINAL 4 OF SECONDARY. TERMINAL 1 OF SECONDARY MUST GO TO TERMINAL 4 OF PRIMARY. TERMINAL 2 OF PRIMARY WILL GO TO TERMINAL 2 OF SECONDARY.

# ACCESSORY COMPONENTS

If your system came with accessory or optional components that require installation or setup, you must review this section for Operator Wiring & Testing and instructions provided by the component manufacturer. In general, those instructions provide guidance needed for installing and using these accessory components.

The following table lists the accessory components that may have been provided with your system.

| Component or System  | Comments  |
|--|---|
| <p><b>Note:</b> Certain components should be considered mandatory on all systems. These are noted below and should be procured, installed, and tested before the system is commissioned and used by the owner.</p> |   |
| Vehicle Loops & Loop Detectors   | These are required to restrict or limit gate operation under certain vehicle detection or in conjunction with access control station vehicle presence detection. A socket for the loop detector electronic control modules are pre-installed in the electrical enclosure. Installer must: fabricate and install loops in the roadway, install the control module (detector), complete the hookup, and programs/adjust detector sensitivity for good interaction of the loops and the gate system. |
| Infrared Photo Electric Sensors  | Used to stop and reverse the Gate Panel/Drop Arm when closing. If an object passes through or blocks the beam, the Drop Arm will remain open while the beam is blocked.   |
| Gate Edge Sensors  | Edges are to cover the entire bottom edge of the gate and are used to stop and reverse the Gate Panel in the intended direction of travel.  |
| Traffic Signal Lights—1 lens, 2 lens, or 3 lens (Ex: Red, Yellow, Green)   | Used to warn of the barrier systems presence and operation. AutoGate recommends an <b>Red</b> LED lens at all times, except when the Gate Panel/Drop Arm is in its fully open position, in which case we recommend a <b>Yellow</b> (amber) flashing lens.   |
| Warning Signs, Reflective Tape, Warning Lights   | Drivers should be alerted to the presence of a high-stopping power barrier system, and that striking the barrier will cause injury or death. Speed limits should also be posted. Contact AutoGate for specific Warning Signs, Reflective Tape, and Warning Lights that can be affixed to the Drop Arm.  |

***CAUTION! Failure to completely install any Reversing Devices may cause your gate to default Open. (Ex.: Hooking up your Loop Wires to the Socket Base while not having the Detector plugged in, or having your IFR Receiver hooked up and not the IFR Transmitter).***

**A. Reversing / Free Exit Loops and Detectors:**

1. Locate your “Homerun” lead-in Loop wires and connect the Free Exit Loop to Socket Base connections #7 and #8 (Free Exit Device).
2. Locate you “Homerun” lead-in Loop wires and connect the Reversing Loop(s) to Socket Base connections #7 and #8. You can wire two (2) Reversing Loops to one (1) Socket Base (Reversing Device). Check the Loop instructions for proper phasing.
3. Plug in Loop Detector in the pre-wired socket base(s).

**B. Photoelectric Sensors:**

1. Verify voltage compatibility, 24v DC is required.
2. Connect signal wire N.O. (normally open) to terminal #5 on your control board.
3. Connect the ground wire to terminal 9, 10, 11, or 12 (commons).
4. Connect the power wires to the terminal strip located inside the control box.

**C. Contact Sensor Edge:**

1. Connect signal wire N.O. (normally open) to terminal #5 on your control board.
2. Connect the ground wire to terminal 9, 10, 11, or 12 (commons).
3. Be certain all wires are secured to prevent damage to the gate during operation.

**D. Vehicle Sensor Probe (Car-Sense 101):**

1. Locate the Car-Sense 101 Vehicle Sensing Probe either along the edge of the Exit Drive
2. Once installed, run the 2-conductor cable to Socket Base connections #6, 7 & 8 (Free Exit Device). Refer to manufacturer’s instructions for proper wiring.
3. Connect the power wires to the terminal strip located inside the control box.
4. Connect signal wire to an open terminal – 1, 2, 3.
5. Connect the ground wire to terminal 9, 10, 11 or 12 (commons).
6. Plug in your Car Sense Detector in the pre-wired socket base.

**E. Gate Auto Timer:**

1. Install your timer in the electrical box.
2. Run a power wire from the time terminal “A” the “Positive” on the control board, run a power wire from the timer terminal “B” to the “Negative” on the control board.
3. Run a power wire from the time terminal “1” to “1”, “2”, or “3” on the control board, run a power wire from the timer terminal “2” to “9”, “10”, “11” or “12” on the control board.

**F. Keypads:**

1. Refer to your Keypad Manufacturer’s Instructions for complete wiring.
2. Run the power wires to Terminal Strip main power (+ and -).
3. The **N.O. & Common** signal wire to open the gate need to be attached to the Circuit Board #'s 1, 2 or 3 (Open 9, 10, 11, or 12 (Common). (Refer to Manufacturer’s Instructions).

**G. Card Readers:**

1. Refer to your Card Reader Manufacturer’s Instructions for complete wiring.
2. Run the power wires to Terminal Strip main power (+ and -).
3. The **N.O. & Common** signal wires to open the gate need to be attached to the Circuit Board #'s 1, 2, or 3 (Open) & 9, 10, 11, or 12 (Common). (Refer to Manufacturer’s Instructions.)
4. We recommend using a ground rod to minimize lightning damage.

## WARNING!

**WARNING: DISCONNECT BATTERIES AND AC POWER BEFORE SERVICING ANY MECHANICAL OR MOVING COMPONENTS!**

**WARNING: FOR CONTINUED PROTECTION AGAINST FIRE, ONLY REPLACE WITH THE SAME TYPE AND RATING OF FUSE.**

# TROUBLESHOOTING & CHECKING CONTROL BOARD

## Checking Batteries & Charging

Note: When the batteries become weak the gate can begin to run erratically or stay open.

- Turn off the AC power and put an Volt meter across the battery terminals to measure voltage. Cycle gate for five (5) to ten (10) cycles while observing voltage and low battery indicator LED D12. If LED 12 comes ON, the batteries are too weak to function properly. Correct voltage across the batteries is a minimum of 23.5 to 25 VDC.
- If LED D12 does light, gate will default open indicating LOW batteries. In this test or in a real power loss, even if **Switch 8** on S2 is off (*refer to switch settings on pg. 20*). Return of AC power will trickle charge the batteries. You may have to re-charge the batteries as they may be too weak for the board to re-charge quickly. If the batteries won't charge, remove and LOAD test and replace if bad.
- Correct charge voltage is 27.0—27.5 VDC with batteries not connected (adjustment is at R63).

## Gate Will Not Close

- Check for any active inputs on terminal inputs D15-D24, AC power loss, AC power switch is off or weak batteries.
- Check that batteries are connected properly. Is switch S3 in “ON” position (this is manual open switch). Check if S2 switch number 8 is in “ON” position and if AC power is lost, See LED D14.
- Check LED D12, if lit and AC power is off, then batteries need to be charged or replaced.

## Gate Will Not Open

- Check for AC power loss at D14 (check AC power switch) and that batteries are fully charged.
- Check fuses and if inputs are wired correctly, test S3 manual open switch.

## Gate Dead—No Operation

1. Make sure both DC Power Toggle Switch and A/C Power switch are on. If no LED lights are “lit” on the board proceed to #2. If LED lights are “lit” verify HBEAT (D11) is flashing? If flashing proceed and D12 BAT LOW LED is off proceed to #2 . If HBEAT (D11) is not flashing and other LED's are “lit” the control board is bad (contact AutoGate for replacement).
2. Check A/C indicator light on cabinet, is it on? Yes, go to step #3; No, check 3 amp fuse on battery tray, if good, go to step #3, if bad replace and check again. If No A/C, source external power problem back to fuse box.
3. Check F3 & F4 fuses on control board. If bad, replace. If they continue to blow the control board is bad.
4. If D14 (AC) & D5 (BRAKE) are on, then gate has repeatedly sensed obstructions. Clear obstruction, turn off AC and DC power. Now turn AC and DC power back on and test system.
5. If steps above do not restore operation contact AutoGate Tech Support at 1.800.944.4283.

### **IRD (D2) Led Is Flashing**

MRT (Maximum Run Timer) has expired. Gate was unable to reach the closed limit switch. Check that fast run timer is set to run as long as possible. (SW1 #'s 1-5 should all be on).

### **Fuse(s) Are Blown**

F3 (15 AMP AC) AND/OR F4 (15 AMP DC) Check for shorts in wiring. If F3 AC fuse is blown, then batteries may also be dead. If you continue to blow fuses and no apparent shortages are visible, you most likely have a blown control board and it will need to be replaced.

### **Gate Closes Then Reverses**

See IRD adjustments, also check for obstacles in gate travel, such as trees, sticks, etc. Check batteries for voltage, if batteries are weak, it can cause the gate to not reach the close limit and re-open.

### **Charge Voltages**

Charge voltage to batteries too low, adjust at R63. With batteries disconnected, set to 27.5.

### **Motor Doesn't Stop**

If gate closes and motor continues to run the limit switch may need adjustment or replacement.

### **IRD Obstruction Signal to Other Gate Note Working Correctly**

Remove connector at J3, obstruct gate, LED D13 should go off for a few seconds. This indicates signal was transmitted. Be sure gates have a common ground.

### **Manual Operation**

The VP gate is easily operated manually in the event of total power or component failure.

1. Turn main power switches off (both A/C & D/C).
2. Release the belt tension lever located under the gear motor to remove the belt tension.
3. Position yourself in front of operator and lift up on Linkage Arm at the pivot point 1"-2".
4. Walk out to end of gate and lift gate to the open position.
5. Place the T/M pin through the bracket holes to prevent the gate from lowering.
6. Secure the belt tension lever in the locked position to re-apply tension to the belts.

### **NOTE:**

**It only takes 16 - 30 lb. of force to open gate. If more is required, contact your dealer or AutoGate.**



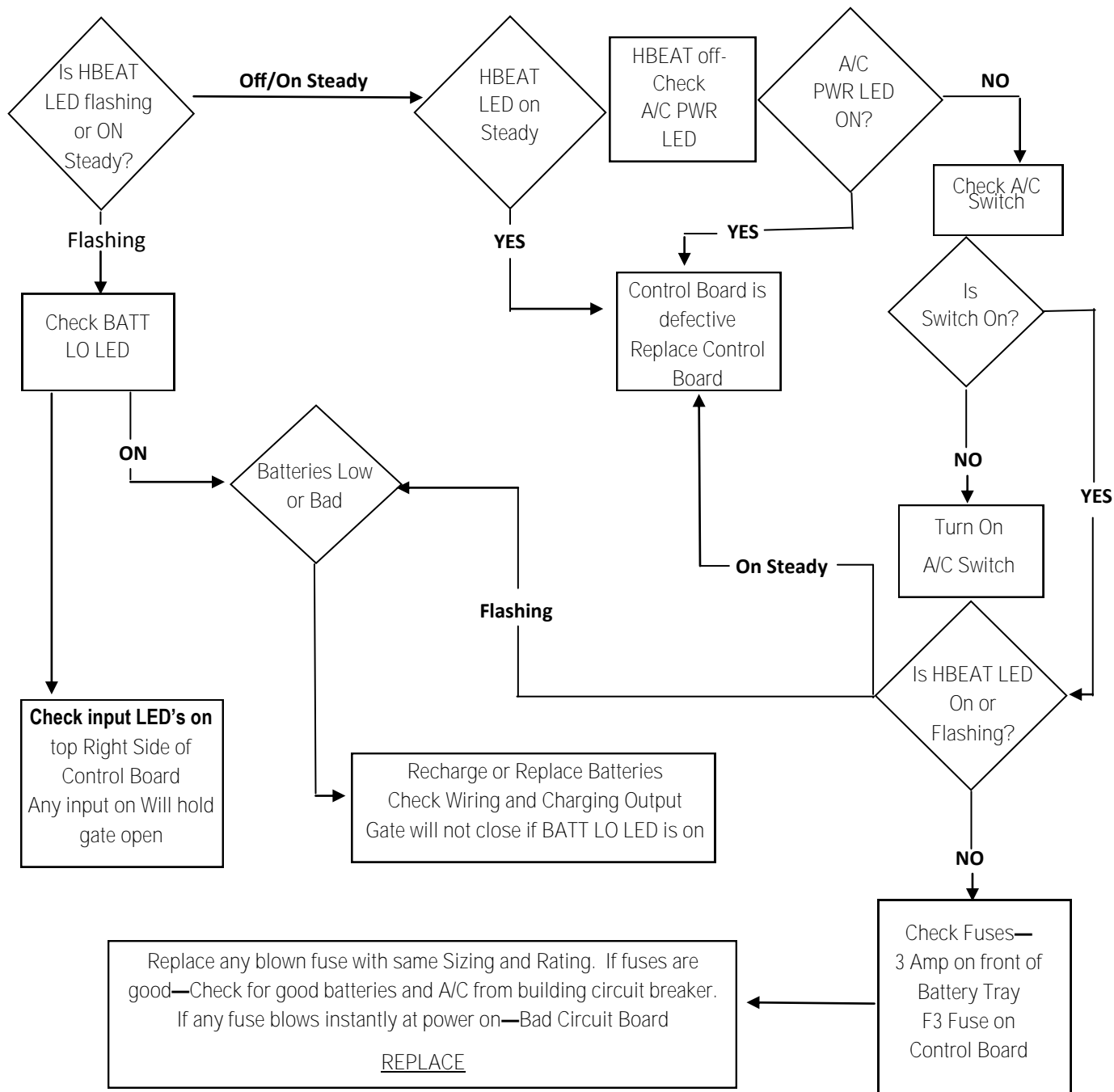
# ELECTRICAL QUICK CHECK GUIDE

Follow the steps in this chart to see if you can restore service of your gate.

This is a visual check without the use of a voltmeter.

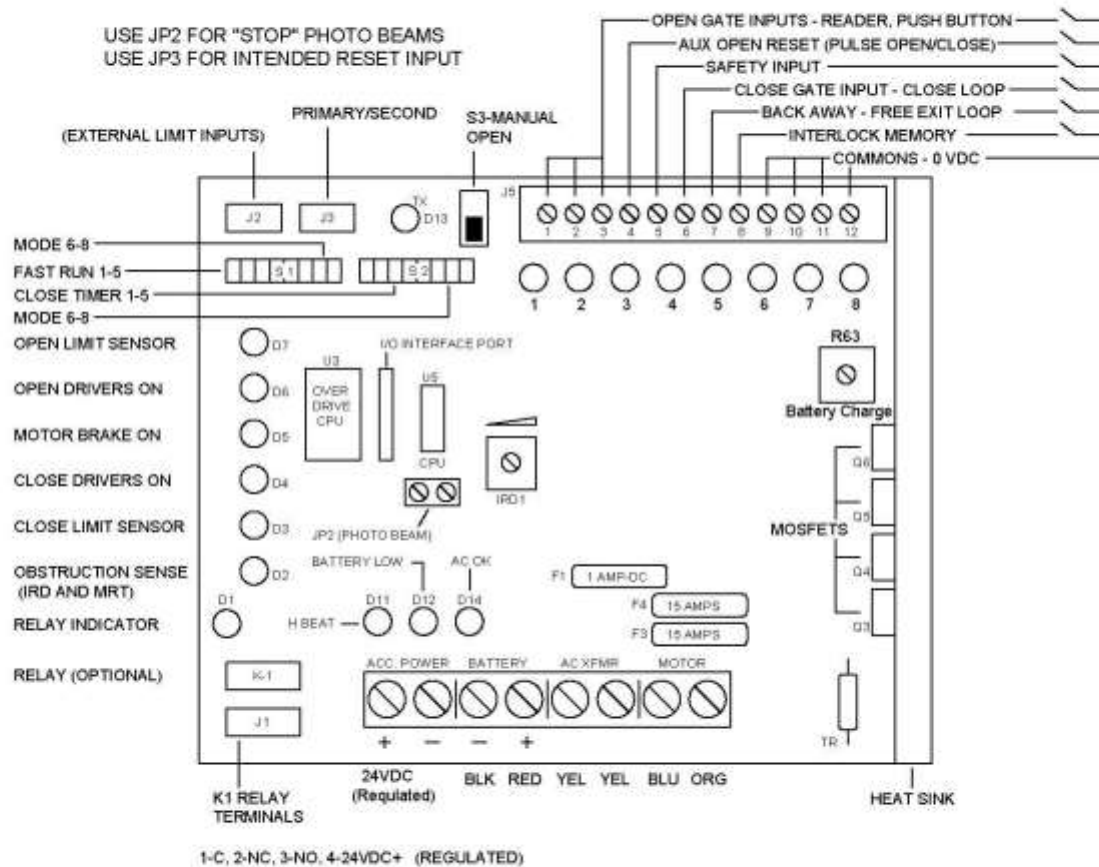
Start by opening the cabinet door to the operator.

Then open the electrical control box and look on the control board for the HBEAT LED,  
located at the lower left corner of the control box.



# CONTROL BOARD LAYOUT

READ SAFETY INSTRUCTIONS BEFORE WIRING



ACCESSORY POWER IS 24VDC REGULATED RATED AT 500 ma. [ 1/2 AMP ]  
[ POWER AT ACCESSORY+ AND AT REALY PIN-4+ IS FUSED AT F1 WITH A 1 AMP FAST-BLO FUSE ]

J5 #4 FOR USE WITH HARD WIRED LINE OF SIGHT DEVICES TO OPEN GATE AND RESET UNIT

D11 - HEART BEAT - SHOWS THAT PROCESSOR AND PROGRAM ROUTINE ARE RUNNING PROPERLY

D12 - BATTERY STATUS - SEE DIAGNOSTIC PROCEDURES

D14 - AC POWER INDICATOR - SHOWS THAT AC POWER IS PRESENT

S3 - MANUAL OPEN - TO ALLOW GATE TO BE OPENED OR CLOSED DURING SERVICE OF UNIT


F1 - 1 AMP FAST BLO FUSE (5mm x 20 mm). MAXIMUM CONTINUOUS DRAW IS 1/2 AMP (U.L. LISTED FUSE ONLY)

F3 - 15 AMP ATO TYPE FUSE FOR 24VAC INPUT POWER (U.L. LISTED FUSE ONLY)

F4 - 15 AMP ATO TYPE FUSE FOR 24VDC BATTERY INPUT POWER (U.L. LISTED FUSE ONLY)

JP2 - INPUT FOR PHOT BEAM AS A SECONDARY ENTRAPMENT PROTECTION

7306 Driver Rd, PO Box 50  
Berlin Heights, Ohio 44814  
Phone: 1 (800) 944-GATE  
(419) 588-2796  
Fax: (419) 588-3514

|       |   |          |          |          |  |  |                                |   |
|-------|---|----------|----------|----------|--|--|--------------------------------|---|
|       |   |          |          |          | <b>NOTICE</b>  |  | Date: 11/15/05                 |  <b>AutoGate</b><br>Gate Entry Systems<br>Berlin Heights, Ohio<br>Fax (419) 588-3514 |
|       |   |          |          |          | THE INFORMATION CONTAINED<br>ON THIS DOCUMENT IS<br>CONFIDENTIAL. ANY<br>DISSEMINATION, UNAPPROVED<br>COPYING OR COPYING OF<br>THIS INFORMATION IS<br>STRICTLY PROHIBITED. |  | Des. By: MKS                   |   |
|       |   |          |          |          |  |  | Supercedes: 8/23/04            |   |
|       |   |          |          |          |  |  | Dwg.: 109                      |   |
|       |   |          |          |          | UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES<br>ANGLES ± 1°<br>XX ± 1/32, XX ± .01, XXX ± .005   |  | Title: DC Control Board Layout |   |
| Rev.: | Description:                                    | Date:    | Des. By: | Ckd. By: |  |  |                                |   |
| B     | Primary/Second "J3" was labeled as Master/Slave | 06/06/14 | MKS      | DMR      |  |  |                                |   |
| A     | General revisions, new Title Block              | 04/07/09 | MKS      | DMR      |  |  |                                |   |

√ MKS 06/06/14

AG-SBS\Engineering\AutoCAD Drawings\Layout and Site Drawings\Standard VPL Drawings\109 Control Board Layout.dwg

# MAINTENANCE

The basic electrical and mechanical systems require only minimum routine maintenance. The following items should be checked and serviced periodically depending on amount of use. Each item below has supporting illustrations and/or instructions in this manual. Contact AutoGate for any questions or issues. Maintenance is important to any gate system and can affect safety, warranty, quality operation, and life-cycle of the system.

| ITEM  | RECOMMENDED MAINTENANCE                  |
|---|--|
| Grease pivot points on Linkage Assembly<br>(“LUBRIPLATE ‘R’ LOW TEMP” Grease)   | 10,000 cycles or 6 months                |
| Grease all bearings: two (2) Operator Arm, four (4) Bullwheel Shafts  | 10,000 cycles or 6 months                |
| Grease Chain Tension Bolt and Lube Chain & lightly coat springs   | 10,000 cycles or 6 months                |
| Check belts for wear and tightness.<br>(Belt flex between motor and Intermediate sheaves is 1/4” deflection & between intermediate and final drive sheaves should be tightened to minimum deflection). Belt(s) loose or worn require replacement. | Every 6 months                           |
| Charge voltage for batteries should be 27.5 VDC with batteries disconnected check at battery terminal on control board (set at R63).  | Every 6 months                           |
| Check battery water level, use distilled water only (Not required on maintenance-free)  | Every 6 months                           |
| Clean snow/ice off of gate (Balance correctly, gate will temporarily tolerate an additional 10 lb. of wt.)  | As needed                                |
| Clean lenses on Photocells or Reflectors  | As needed                                |
| Lubricate (Graphite Oil) all lock cylinders and mechanisms  | Every 6 months                           |
| Check and verify proper operation of all <b>External</b> entrapment protection devices. See page 23 and the external entrapment protection device(s) manufacturers instructions.  | Every month                              |
| Check and verify proper operation of the <b>Internal</b> entrapment protection reversing feature (see page 21, IRD—Instant Reversing Device).   | Every month                              |
| Check gate balance (see page 30)  | Four months after install, they annually |

## **SPRING CHANGING INSTRUCTIONS**

**ONLY AUTHORIZED PERSONNEL SHOULD PERFORM SPRING CHANGES**

**TOOLS REQUIRED:** 5/16" (Nut Driver), 1/2", 1 1/8", 1 5/16" Open End Wrenches

Step 1) For ease of access, remove the door and end panel nearest the gate.

Step 2) Disable the photo eye if equipped.

Step 3) Remove any upper "T" bolts completely

Step 4) Loosen the top adjusting nut of the slide assembly. Thread the nut up to within four (4") inches of the top of slide mechanism.

Step 5) You will now raise the gate. (**DO NOT** release the disengage lever!) Initiate the gate to open, immediately move to the gate and help raise it open, once the slide moves up, hold on the bottom rail of the gate until fully open. The gate may bounce slightly, there will be a loud bang but no damage will occur.

Step 6) Turn Off AC & DC Power before gate "times out" and tries to close. Insert T/M Pin.

Step 7) Using a 1 5/16 wrench, loosen and remove the chain tension bolt with the damaged spring.

Step 8) Replace damaged spring

Step 9) Replace chain tension bolt. **NOTE:** Grease fitting must point up! Tighten bottom nut. **NOTE:** Chain **MUST** remain level and not twisted once tightened.

Step 10) Remove T/M pin and restore A/C & D/C power.

Step 11) Lowering the gate. Initiate the gate to close and at the same time, assist the gate down by pulling on the bottom rail of the gate. The slide will move down and another loud bang as the gate is lowered.

Step 12) Turn off both A/C and D/C power.

Step 13) Thread the slide nut back down to the slide assembly and tighten.

Step 14) Replace the T-Bolts to their original location and tighten.

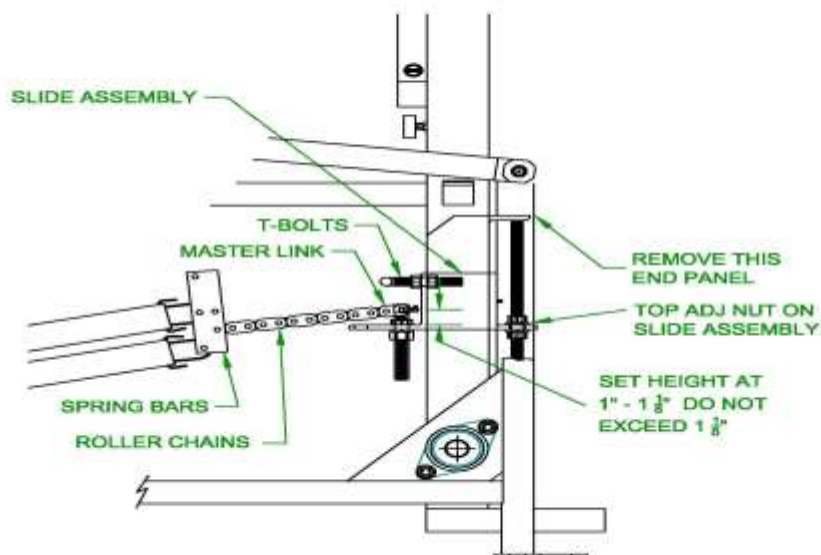
Step 15) Restore A/C and D/C power and hook photo eye back up.

Step 16) Cycle gate.

Step 17) Spray all springs with a chain lube to prevent corrosion.

**RECOMMENDED:** Always check and adjust the balance after any spring change. Refer to balancing instructions at [www.AutoGate.com](http://www.AutoGate.com) or the instructions on Page 30.

### **SLIDE ASSEMBLY DETAILS**



# QUICK REFERENCE GUIDE

## Touch-Up Paint

For scratches and following minor repairs use Rustoleum® Painters Touch 2x Ultra Cover to match the AutoGate Standard Colors. All colors Gloss Black, Dark Gray, Kona Brown, Hunter Green, & White.

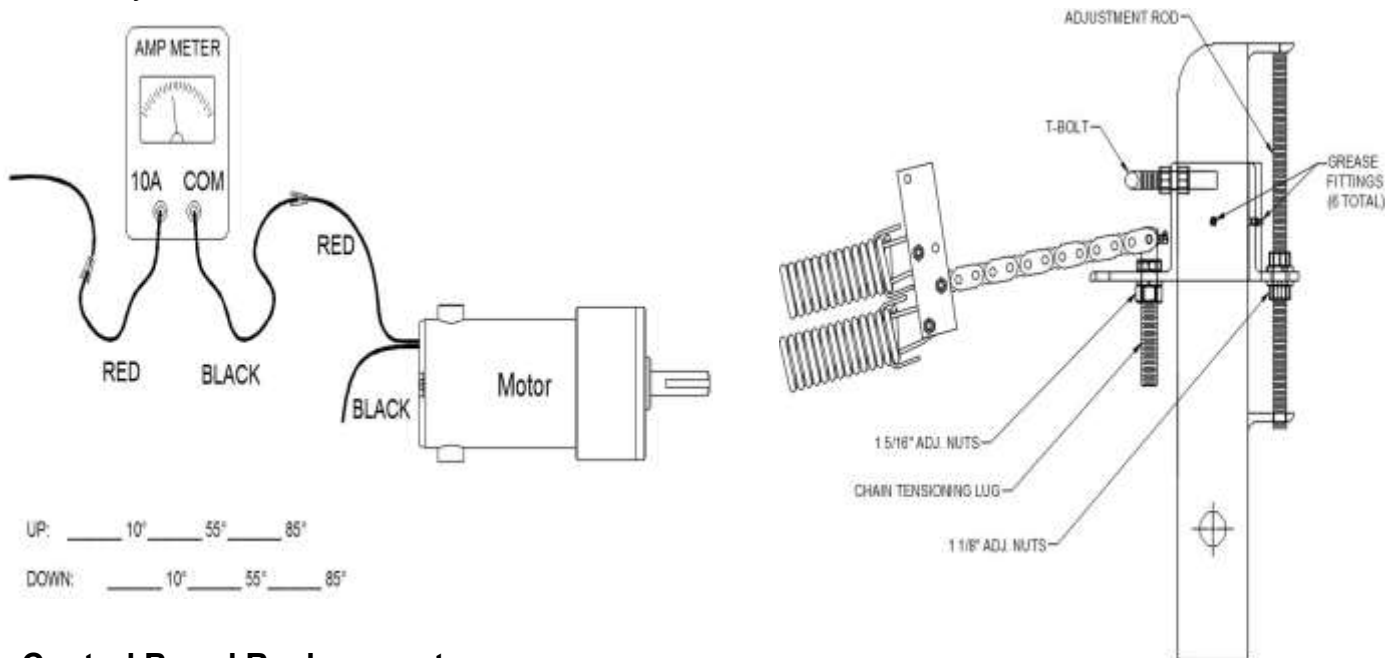
## Balancing a Gate

Recommended four (4) months after installation, then annually. It is recommended to check the balance of the Operator. It is mandatory to re-check the balance if you change a spring(s). You can monitor it on the amp meter installed on the control box door. It is recommended to follow the instructions below for accurate balancing numbers using a commercial grade AMP meter.

Remove the wire nut on the **RED** motor lead and hook up one Amp Meter lead to the **RED** wire and the other Amp Meter lead to the **ORANGE** wire. Cycle the gate up and down and record the highest amp reading in both directions (reading should be in the 2.0 to 6.0 range). The highest reading for both the up and down cycles should be very close to the same. If not, you will have to adjust the SLIDE ASSEMBLY.

Loosen the 1 1/8" nuts on either side of the Slide Assy. Angle on the Threaded Rod. *If the gate Amps are too high in the OPEN mode, move the Slide Assy. UP to help it OPEN.* (This is the most common adjustment Made). *If the gate is flying open and struggling to close, move the Slide Assembly DOWN.* Only adjust the Slide Assembly 1/4" (3 to 4 turns) at a time when adjusting. After each adjustment, check your amp readings.

When you have the gate back in balance (within a half amp (.5) is minimal), tighten both nuts on Slide Assembly threaded rod.

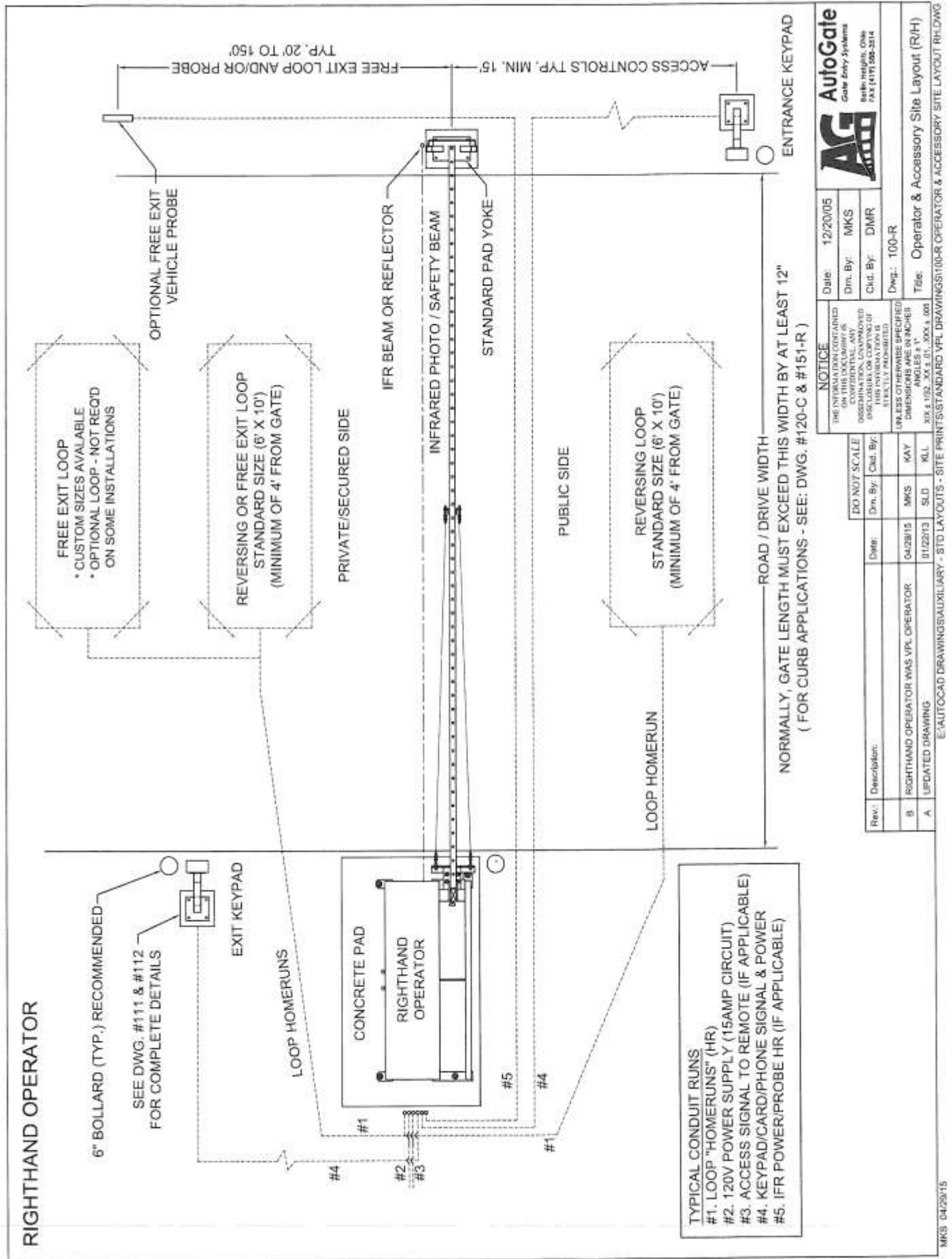


## Control Board Replacement

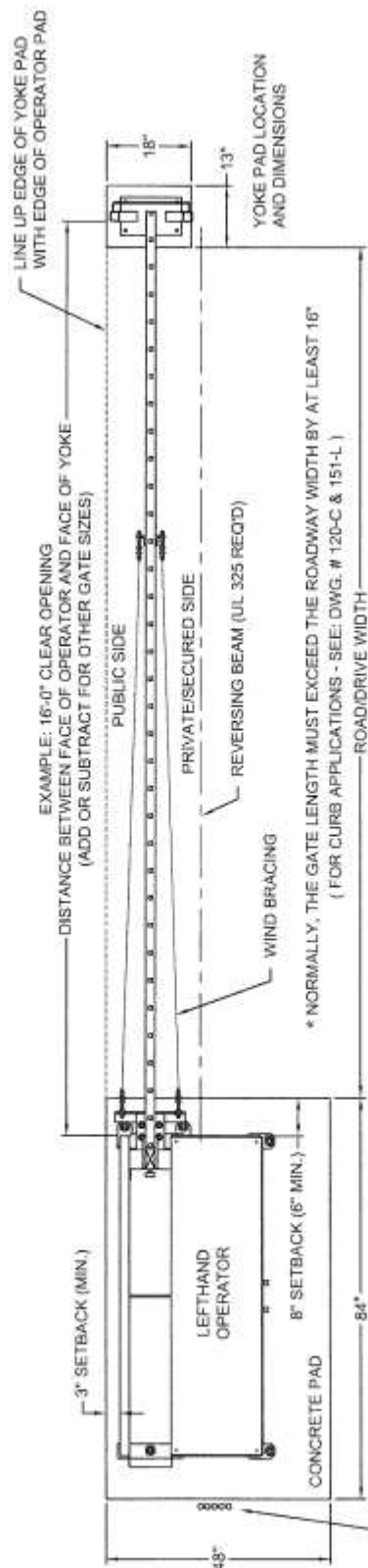
- Turn ALL power off (**AC & DC**) to the board.
- Remove (slide off) J2 "Open & Close" Limit Switch Terminal strip.
- Remove (slide off) Accessories 1 through 12 Terminal strip.
- Carefully remove the wires for the 24 VDC Acc. Power, Battery Power, AC Power & Motor wires.
- Take the board off the Standoffs and remove the two (2) mounting bolts and replace with your NEW circuit board and put all wires and connections back in the same place.

**Double check the D.I.P. switch settings to be sure they are the same as your original board.**

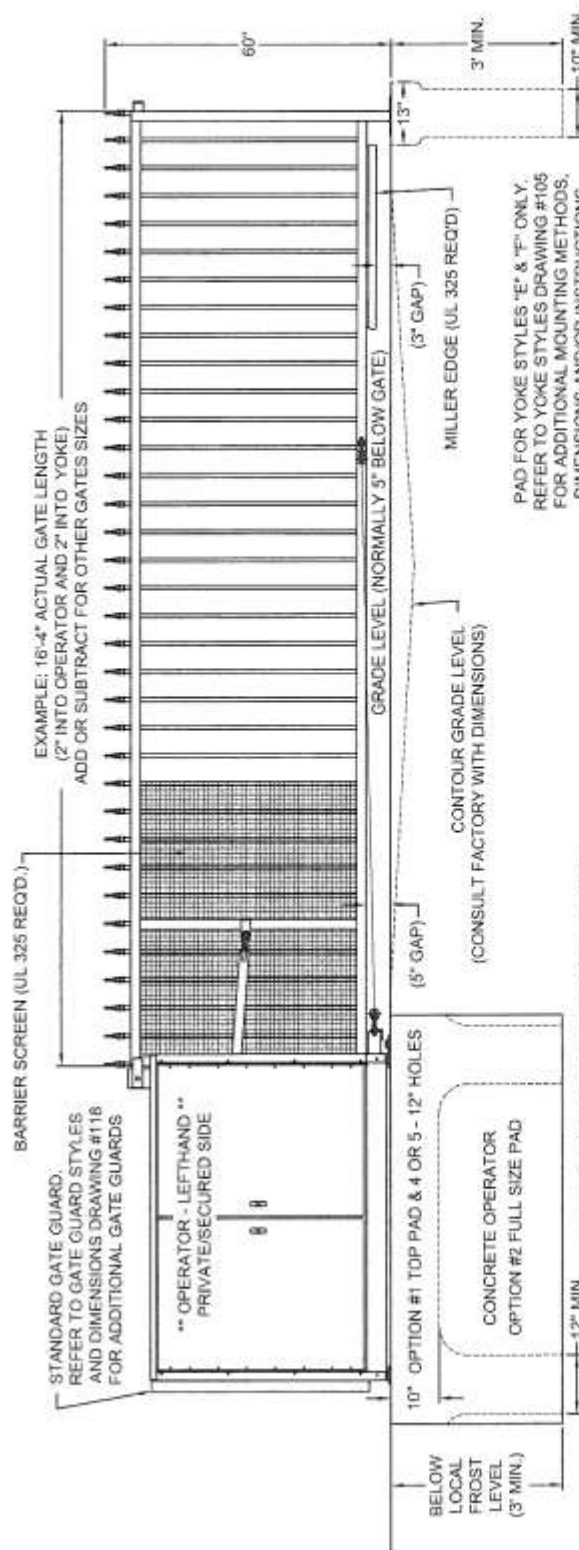




EXAMPLE SHOWN: 16" X 5" BUCKEYE STYLE 500 GATE  
(GATE SIZE AND STYLE MAY VARY)



REFER TO #102C-R FOR CONDUIT DETAILS

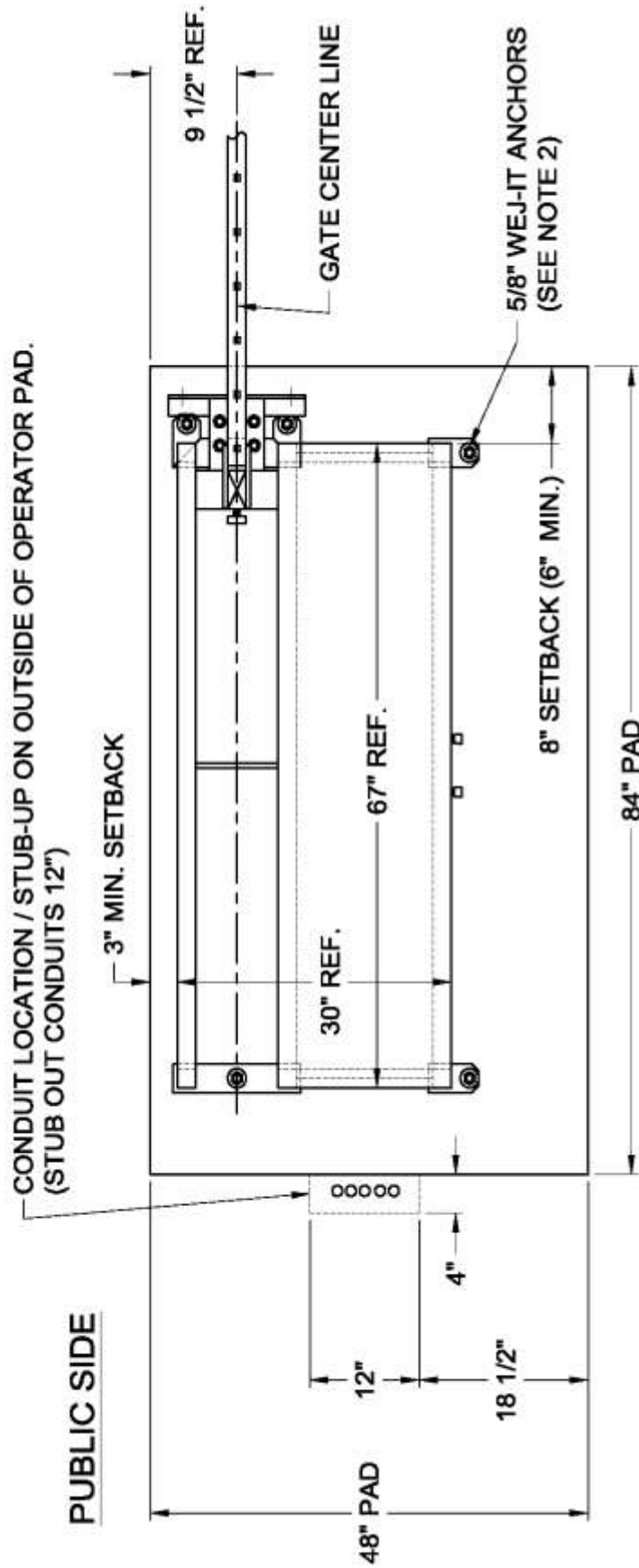


REFER TO OPERATOR PAD LAYOUT DRAWING  
#102-P FOR OPERATOR PAD OPTIONS, NOTES,  
DIMENSIONS AND/OR FIELD INSTRUCTIONS.

|       |              |       |         |          |       |  |  |  |  |  |  |  |
|-------|--------------|-------|---------|----------|-------|--|--|--|--|--|--|--|
| Rev.: | Description: | Date: | Dm. By: | Cld. By: | Date: |  <b>AutoGate</b><br>Gate Entry Systems<br>Lewis Heights, Ohio<br>FAX (615) 585-3514             |  |  |  |  |  |  |
|       |              |       |         |          |       |  |  |  |  |  |  |  |
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|       |              |       |         |          |       | <b>DO NOT SCALE</b><br>Dm. By: Cld. By:  |  |  |  |  |  | MKS  |
|       |              |       |         |          |       | <b>UNLESS OTHERWISE SPECIFIED</b><br>DIMENSIONS ARE IN INCHES<br>N/A x 100 x 55 x 8.1 x 335 x 506  |  |  |  |  |  | DMR  |
|       |              |       |         |          |       | B INCREASED BARRIER SCREEN COVERAGE (ICBM 010-15)<br>01/22/13  |  |  |  |  |  | Dwg.: 101-L                                  |
|       |              |       |         |          |       | A UPDATED DRAWING  |  |  |  |  |  | Title: Standard Layout Dimensions - Lefthand |

NAME DATE TIME

# **LEFTHAND OPERATOR**



## **PRIVATE/SECURED SIDE**

- POSSIBLE CONDUITS \* (USE 3/4" CONDUIT ONLY) \***
- \* 120 VAC, MIN. 15 AMP CIRCUIT
  - \* "ENTRANCE" KEYPAD
  - \* "EXIT" KEYPAD
  - \* REVERSING/SAFETY LOOPS
  - \* FREE EXIT LOOP
  - \* OFFICE COMMUNICATION
  - \* IFR BEAM POWER
  - \* OPTIONAL SPARES

### **NOTES:**

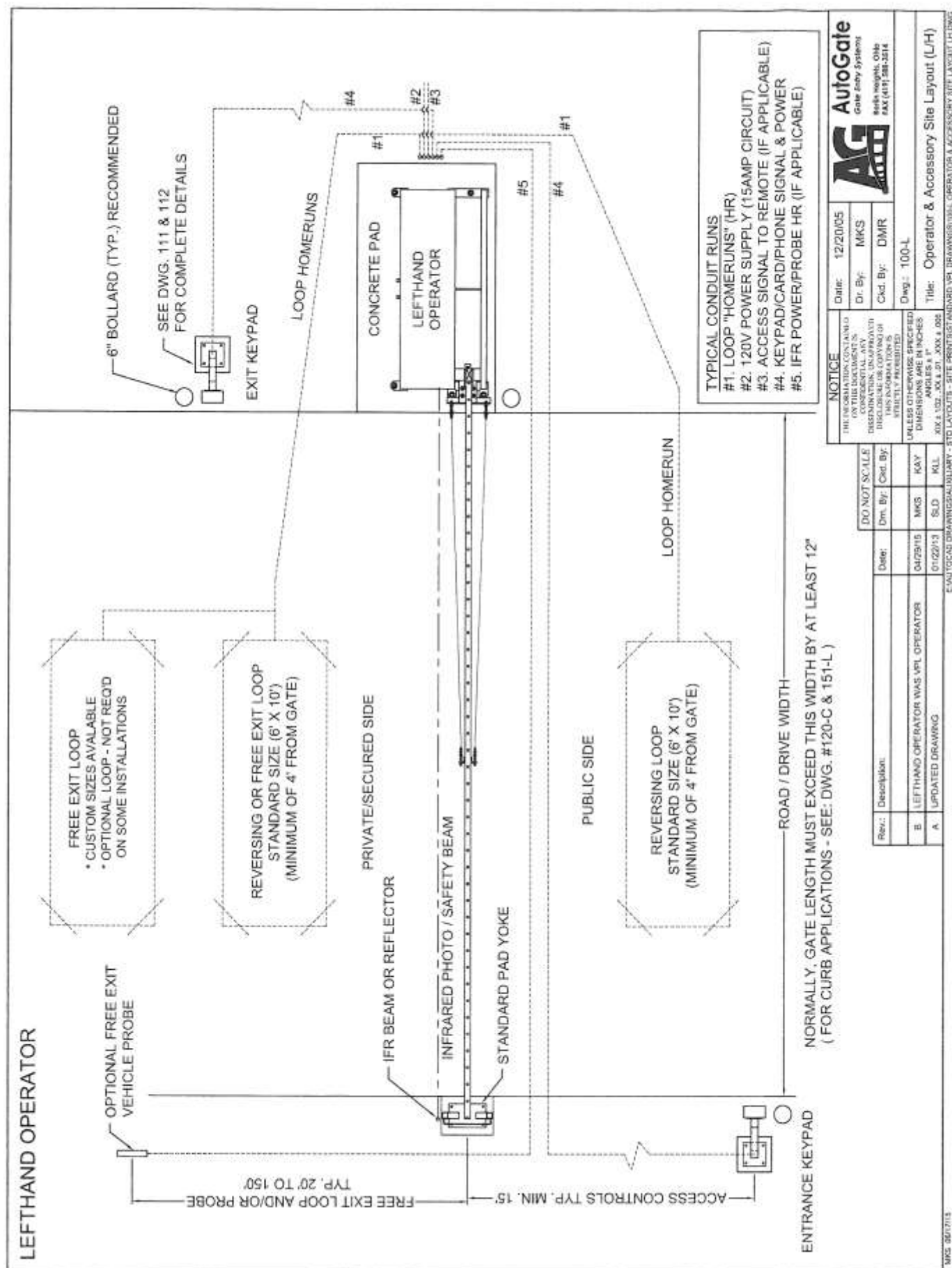
- 1) PAD DIMENSIONS CAN VARY PER SITE
- 2) LEAVE AT LEAST 3" BETWEEN ANCHOR AND EDGE OF PAD
- 3) ALL PADS MUST BE POURED LEVEL AND BELOW LOCAL FROST LINE DEPTH

| DO NOT SCALE |  | NOTICE                         |                                   | Date:    |                                  |
|--------------|--|--------------------------------|-----------------------------------|----------|----------------------------------|
| Rev.:        | Description:                                 | ON THIS DOCUMENT IS            | THE INFORMATION CONTAINED         | Drn. By: | MKS                              |
| D            | COMBINED INFORMATION FROM 102-L              | CONFIDENTIAL. ANY              | DISCLOSURE OF THIS INFORMATION IS | Chd. By: | DMR                              |
| C            | LEFTHAND OPERATOR WAS VPL OPERATOR           | STRICTLY PROHIBITED            | UNLESS OTHERWISE SPECIFIED        | Dwg.:    | 102C-L                           |
| B            | UPDATED DRAWING                              | DIMENSIONS ARE IN INCHES       | ANGLES ± 1°                       | Title:   | Conduit Pad Location (Left Hand) |
| A            | CONDUIT LOCATIONS WERE MOVED OUTSIDE THE PAD | 200 ± 102, 200 ± 21, 200 ± 260 |                                   |          |                                  |



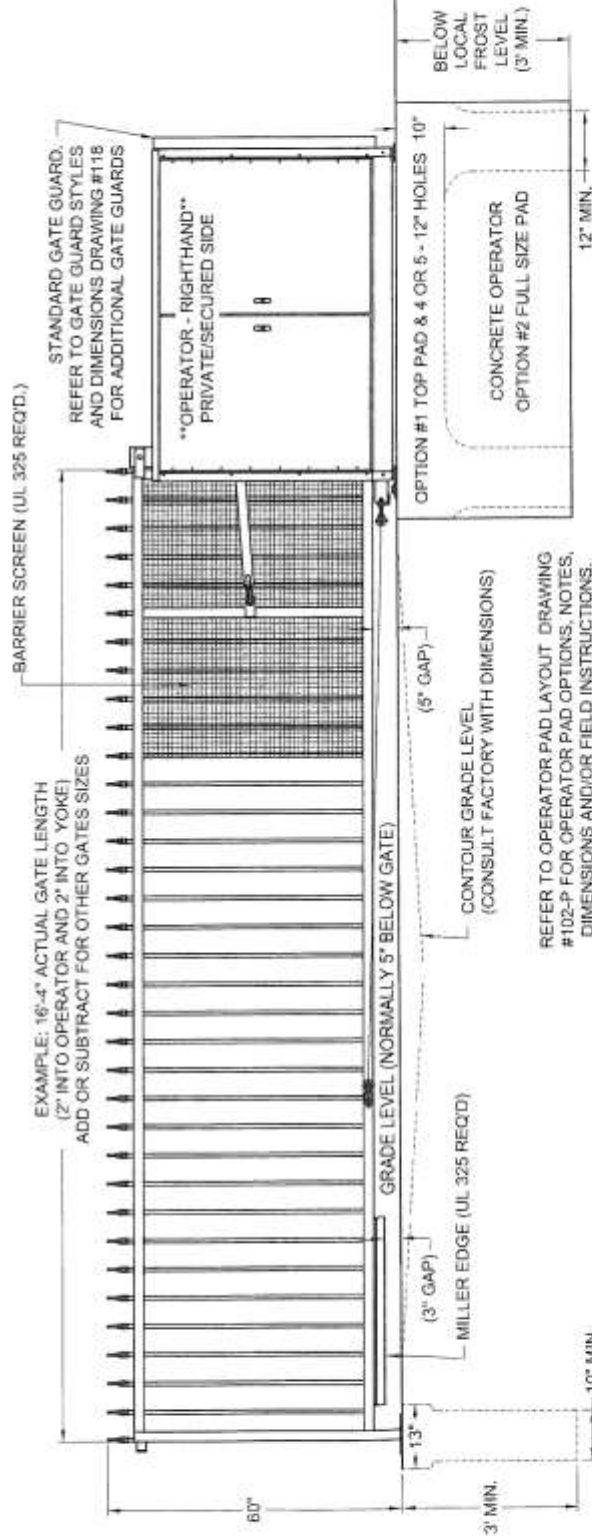
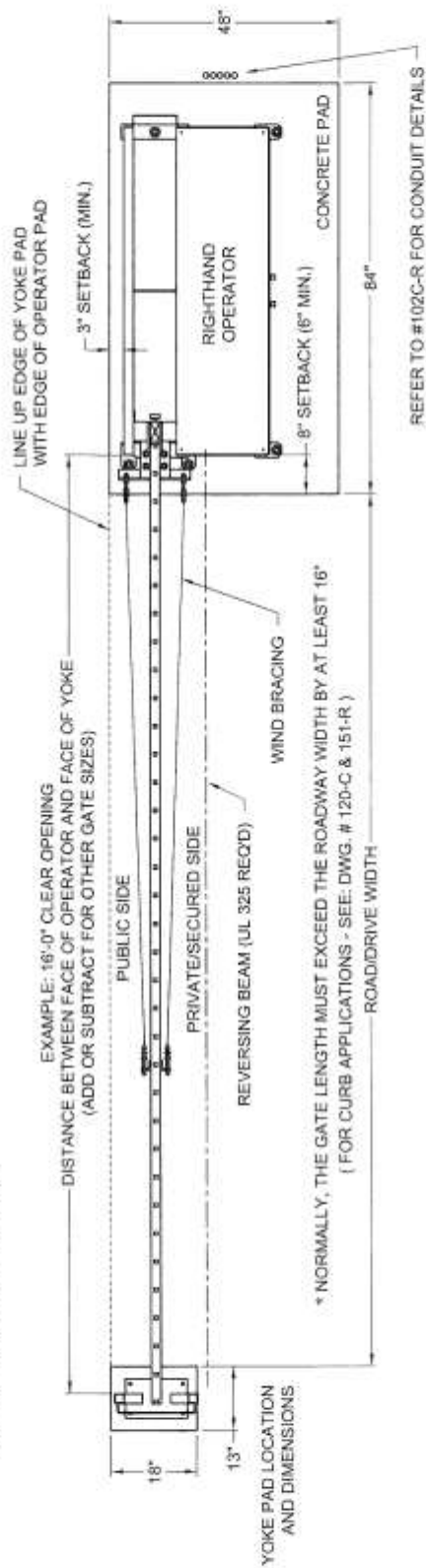
MKS 07/18/16

E:\AUTOCAD DRAWINGS\AUXILIARY - STD LAYOUTS - SITE PRINTS\STANDARD VPL DRAWINGS\102C-L CONDUIT PAD LOCATION LHDWG



# RIGHTHAND OPERATOR

EXAMPLE SHOWN: 16' X 5' BUCKEYE STYLE 500 GATE.  
(GATE SIZE AND STYLE MAY VARY)



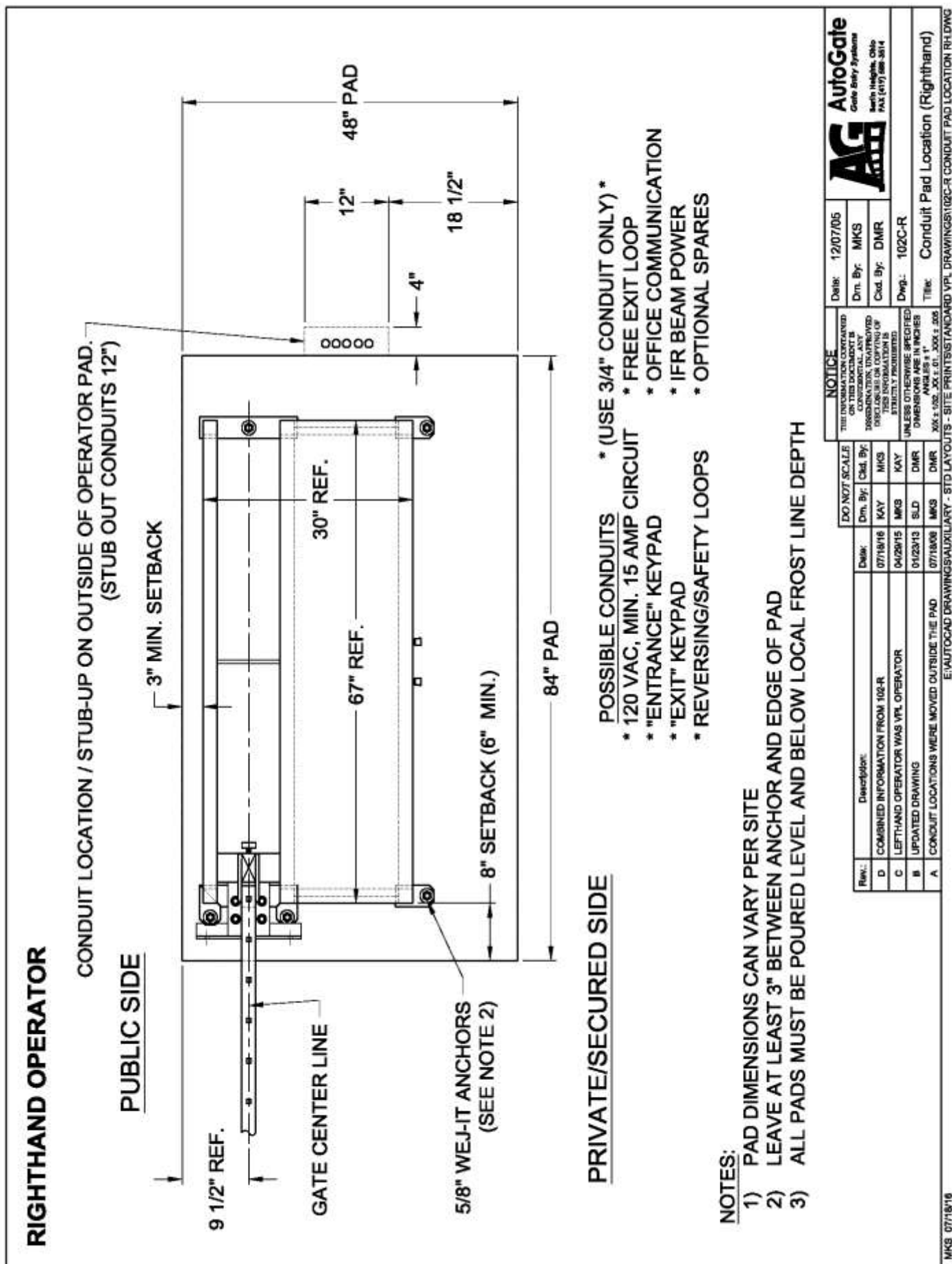
PAD FOR YOKE STYLES "E" & "F" ONLY.  
REFER TO YOKE STYLES DRAWING #105  
FOR ADDITIONAL MOUNTING METHODS,  
DIMENSIONS AND/OR INSTRUCTIONS.

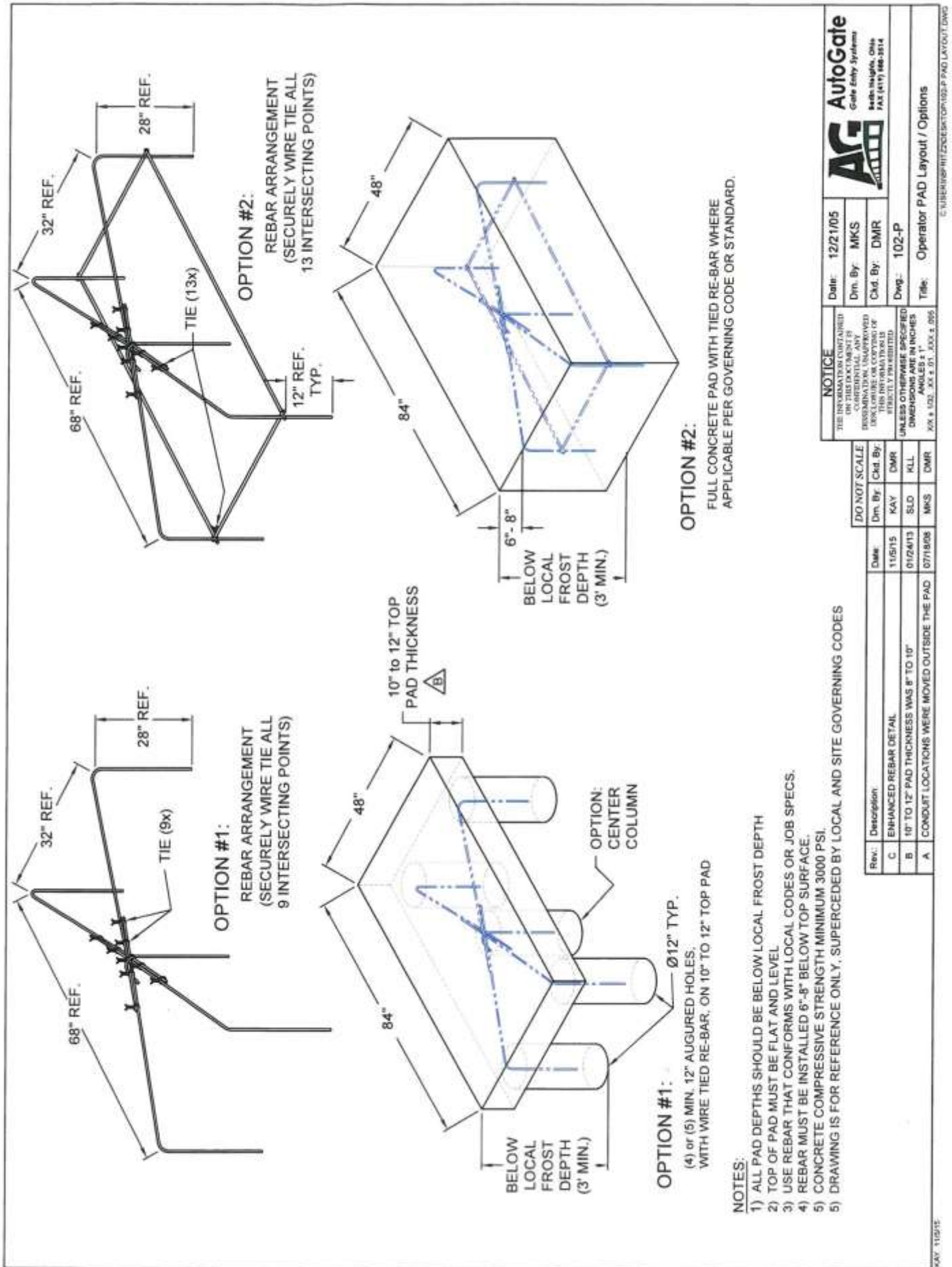
|  |                                   |  |  |
|--|-----------------------------------|--|--|
| <b>NOTICE</b>  |                                   | <b>AutoGate</b>  |  |
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| Rev.:  | Description:                      | Date:  | 12/21/05                               |
| B  | INCREASED BARRIER SCREEN COVERAGE | Drn. By:   | MKS                                    |
| A  | UPDATED DRAWING                   | Ckd. By:   | DMR                                    |
|  |                                   | Dwg.:  | 101-R                                  |
|  |                                   | Title:   | Standard Layout Dimensions - Righthand |

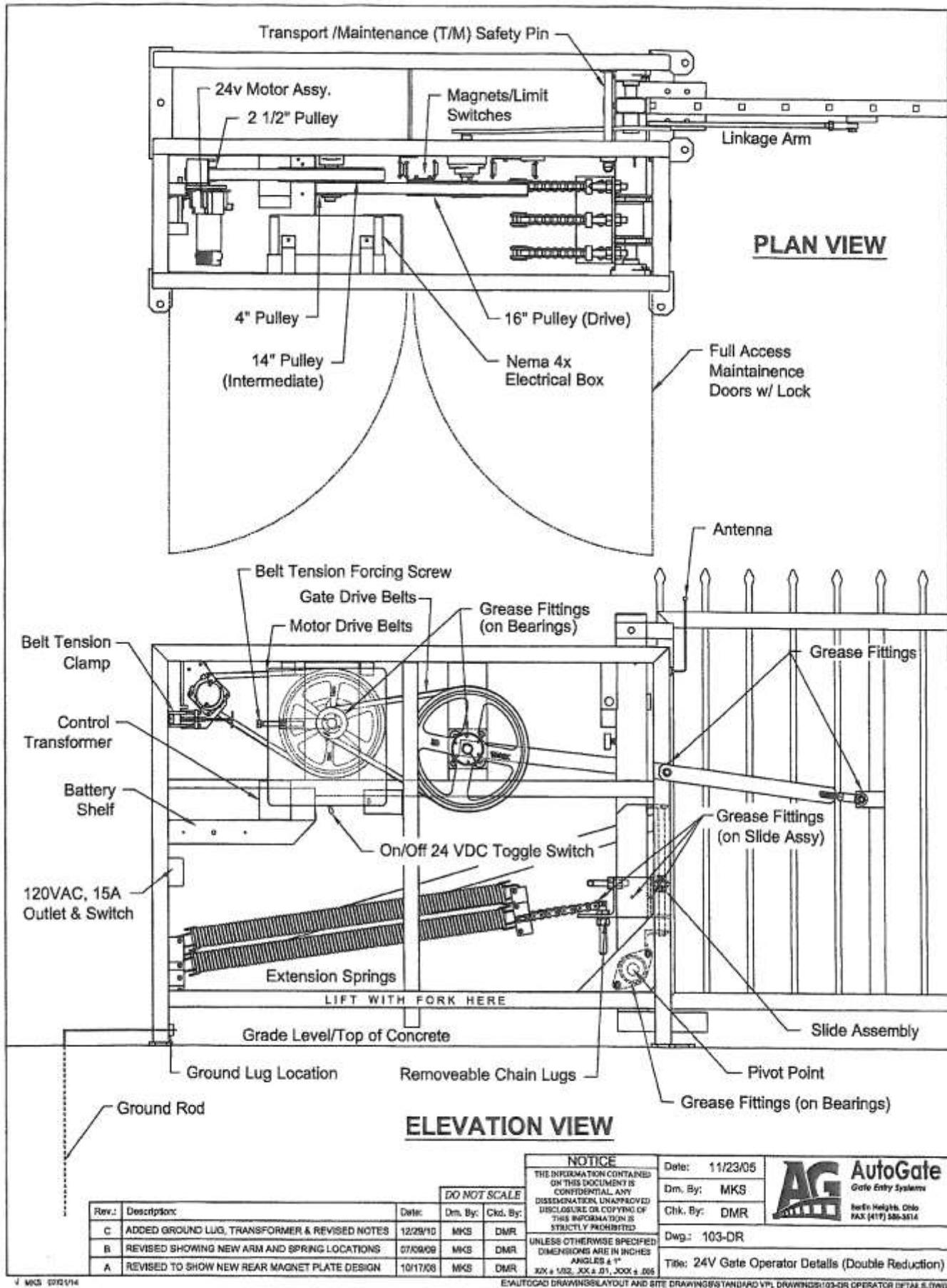
MKS 04/29/15

E:\AUTOCAD DRAWINGS\AUXILIARY - STD LAYOUTS - SITE PRINTS\STANDARD VPL DRAWINGS\101-R STANDARD LAYOUT DIMENSIONS RH.DWG



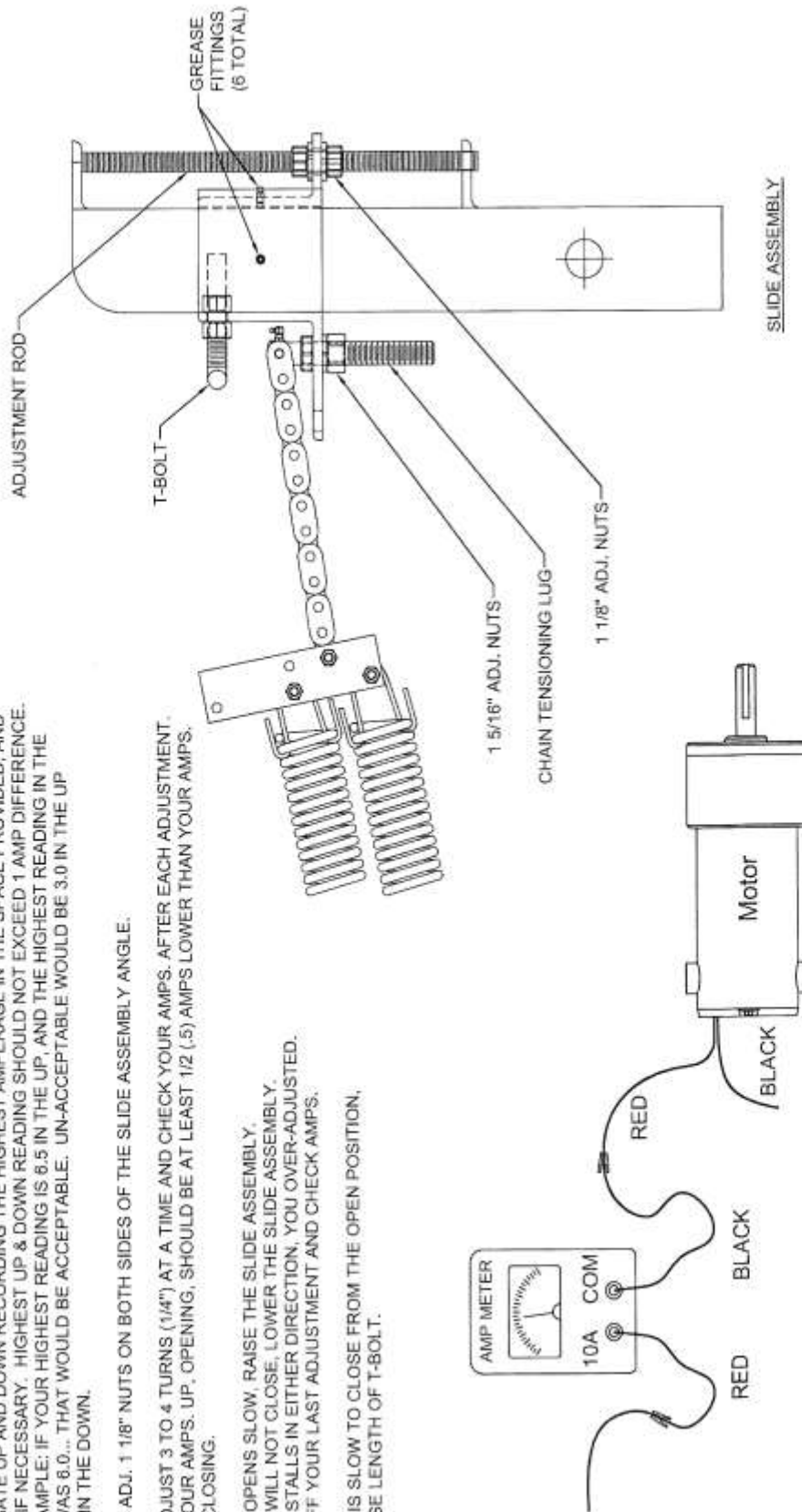






**TESTING AMPERAGE:**

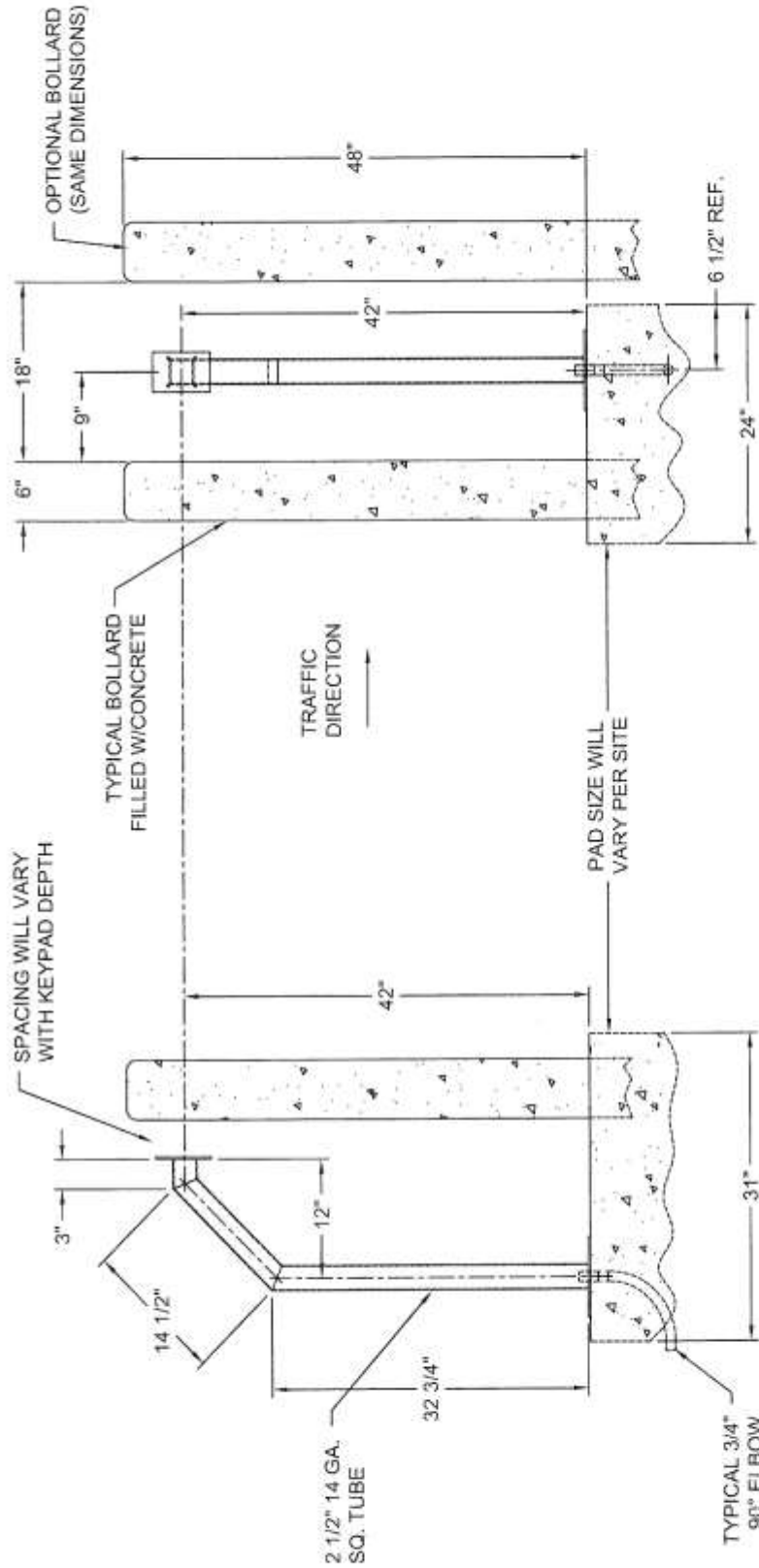
1. CONNECT AMP METER IN SERIES BY REMOVING THE WIRE NUT FROM THE RED MOTOR LEAD.
2. CYCLE GATE UP AND DOWN RECORDING THE HIGHEST AMPERAGE IN THE SPACE PROVIDED, AND ADJUST IF NECESSARY. HIGHEST UP & DOWN READING SHOULD NOT EXCEED 1 AMP DIFFERENCE. FOR EXAMPLE: IF YOUR HIGHEST READING IS 6.5 IN THE UP, AND THE HIGHEST READING IN THE DOWN WAS 8.0... THAT WOULD BE ACCEPTABLE. UN-ACCEPTABLE WOULD BE 3.0 IN THE UP AND 8.1 IN THE DOWN.
3. LOOSEN ADJ. 1 1/8" NUTS ON BOTH SIDES OF THE SLIDE ASSEMBLY ANGLE.
4. ONLY ADJUST 3 TO 4 TURNS (1/4") AT A TIME AND CHECK YOUR AMPS. AFTER EACH ADJUSTMENT. NOTE: YOUR AMPS. UP, OPENING, SHOULD BE AT LEAST 1/2 (.5) AMPS LOWER THAN YOUR AMPS. DOWN, CLOSING.
5. IF GATE OPENS SLOW, RAISE THE SLIDE ASSEMBLY. IF GATE WILL NOT CLOSE, LOWER THE SLIDE ASSEMBLY. IF GATE STALLS IN EITHER DIRECTION, YOU OVER-ADJUSTED. BACK OFF YOUR LAST ADJUSTMENT AND CHECK AMPS.
6. IF GATE IS SLOW TO CLOSE FROM THE OPEN POSITION, INCREASE LENGTH OF T-BOLT.



UP: 10° 55° 85°  
DOWN: 10° 55° 85°

|  |  |   |          |
|--|--|---|----------|
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| Rev.   | Description  | Date  | Dwg. No. |
| C  | Black motor wire was blue and added thread details | 06/18/14  | 107      |
| B  | Revised motor and slide assembly to current style  | 04/07/09  |          |
| A  | General Revision - new Title Block                 | 04/07/09  |          |
| Dwg. No. 107   |  | Title: Balancing Slide Assembly   |          |
| Dwg. No. 107   |  | Title: Balancing Slide Assembly   |          |

AutoCAD Drawings/Layout and Site Drawings/Standard VPL Drawings/107 Balancing Slide Assembly.dwg



# NOTES:

1. TYPICAL LAYOUT - CHECK MANUFACTURER'S SPECIFICATIONS FOR THE ACTUAL DIMENSIONS.
2. 1/2" CONCRETE ANCHORS PROVIDED
3. POUR PADS BELOW LOCAL FROST LINE
4. POSITION BOLLARDS TO PROTECT KEYPAD

## GOOSENECK BASE PLATE - CS (X-0101) NOT TO SCALE

|  |  |  |               |                 |              |
|--|--|--|---------------|-----------------|--------------|
|  |  | Date: 12/07/05   | Drawn By: MKS | Checked By: DMF | Dwg. No: 112 |
|  |  | Title: Gooseneck with Bollards   |               |                 |              |
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| AutoGate Systems, Inc.<br>11111 E. 113th St.<br>Suite 1000<br>Omaha, NE 68148<br>Phone: (408) 598-2014<br>Fax: (408) 598-2014  |  | AutoGate Systems, Inc.<br>11111 E. 113th St.<br>Suite 1000<br>Omaha, NE 68148<br>Phone: (408) 598-2014<br>Fax: (408) 598-2014  |               |                 |              |

MKS: 05/01/15

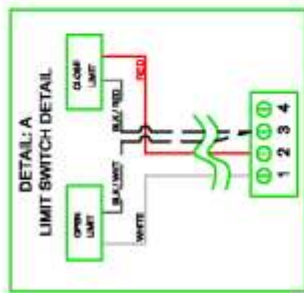


NOTE: ALL ACC. ARE  
OPTIONAL EQUIPMENT

TABLE "A"

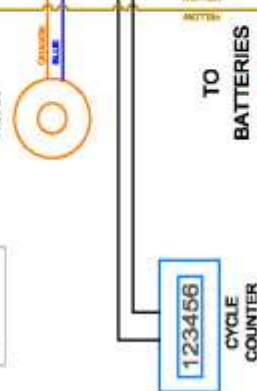
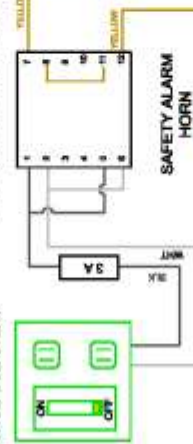
- 1, 2 & 3 - OPEN INPUTS  
4 - AUXILIARY OPEN INPUT  
5 - REVERSING/SAFETY INPUT

- 6 - CLOSE GATE INPUT (CLOSE LOOP)  
7 - BACK AWAY - FREE EXIT LOOP  
8 - SHADOW LOOP  
9, 10, 11, & 12 - COMMON (Dvdc)



120V AC/15A  
SERVICE USE ONLY!

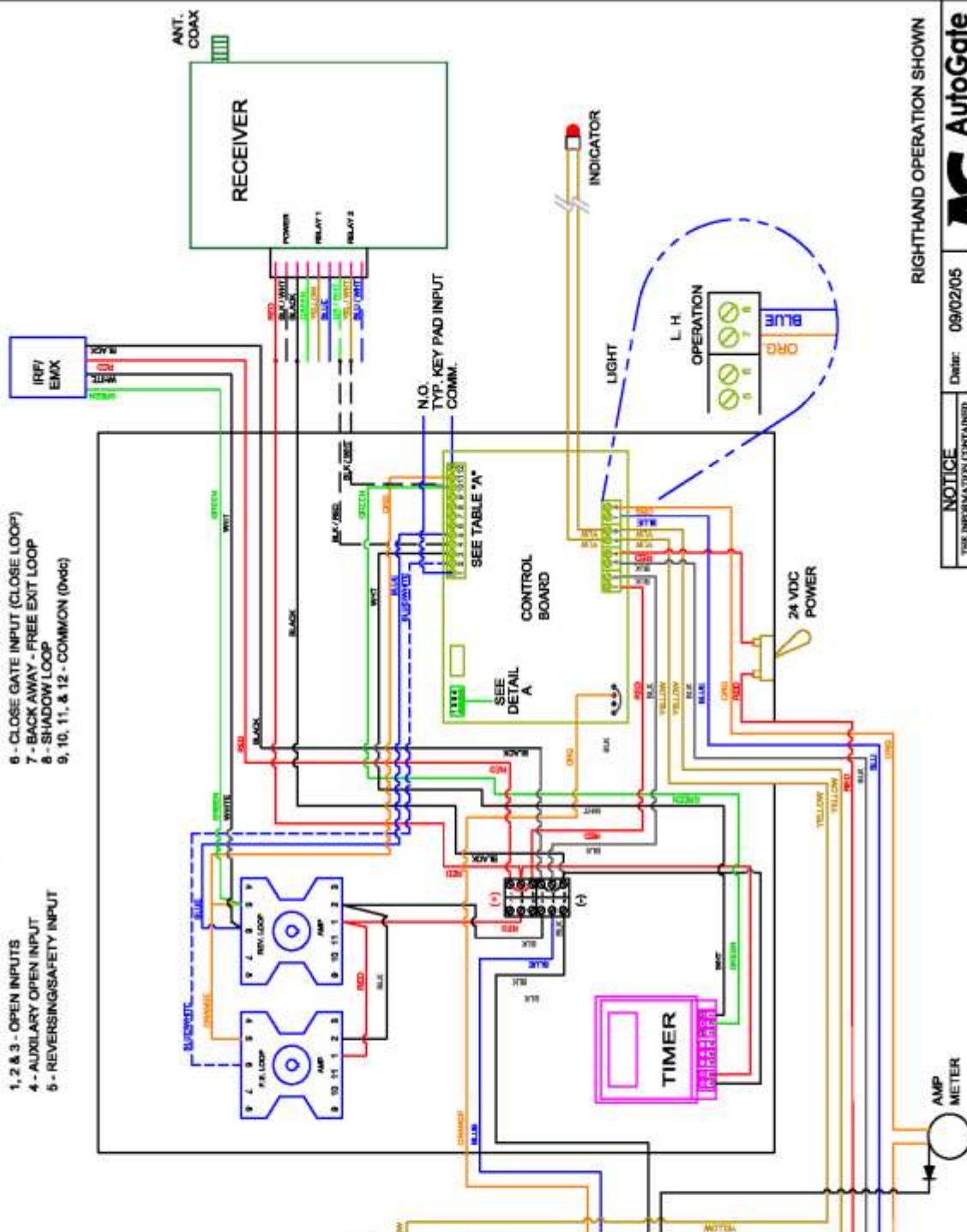
TRANSFORMER



CYCLE  
COUNTER



AMP  
METER



RIGHTHAND OPERATION SHOWN

|   |           |          |
|---|-----------|----------|
| <b>NOTICE</b><br>THE INFORMATION CONTAINED<br>ON THIS DOCUMENT IS<br>UNCLASSIFIED AND IS<br>DISCLOSED ON COPIING OF<br>THIS INFORMATION IS<br>STRICTLY PROHIBITED | Date:     | 09/02/05 |
|   | Drn. By:  | MKS      |
|   | Clad. By: | DMR      |
|   | Dwg.:     | 113      |
| <b>AutoGate</b><br>Gate Entry Systems<br>1400 N. Highways, Ohio<br>FAX (419) 444-3414   |           |          |
| Title: 24V DC Control Board Wiring Diagram  |           |          |

|       |   |          |          |           |
|-------|---|----------|----------|-----------|
| Rev.: | Description:                            | Date:    | Drn. By: | Clad. By: |
| B     | REVISED SOCKET BASE WIRE PER ECR-012-17 | 04/18/17 | KAY      | EGG       |
| A     | REVISED TO MATCH CURRENT ASSEMBLY       | 06/02/14 | EGG      | MKS       |

KAY 04/18/17

