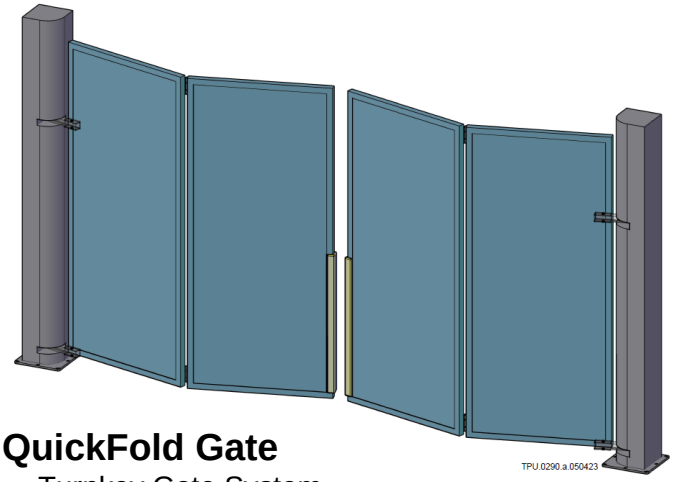
TORXUN
QuickFold Model 3 Gate System

MODEL 3 Operator

- Complete, self-contained swing gate system.
- Includes hinges, post, operator, and control panel
- Supports single leaf or folding-leaf gates up-to 1200 lbs
- UL-325 Listed
- Proven reliability + durability



QuickFold Gate

- Turnkey Gate System
- With or without overhead guide designs
- Million cycle durability
- Flexible design from high security to high-end residential applications

TORXUN
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Tracy, CA 95304
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Email: sales@TORXUN.com
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UL LISTED

Use this manual for

TORXUN QuickFold MODEL 3 Gate System

DEAR TORXUN CUSTOMER,

Welcome, and thank you for your purchase. Our commitment to quality and innovation will become evident as you become familiar with the features and performance of this vehicle gate system. All TORXUN™ QuickFold MODEL 3 Gate Systems are equipped with the APEX Controller that offers exceptional control features.

Please take a few minutes to study this manual. The benefits of taking a little extra time to align the gate operator properly and verify a fully functional installation will ensure customer satisfaction, a longer life and minimized maintenance costs.

Installers and owners must thoroughly review and understand the important information regarding UL 325 standards and pedestrian entrapment protection contained within this manual. When an automatic gate is first made functional, the installer must instruct the owners and users how to operate the system correctly and safely. When the installation is complete please leave this manual for the owner's use.

At TORXUN we have spent years installing systems in the real world. This product and these instructions are designed to ensure easy install and operation. If you have questions along the way, please give your TORXUN ™ distributor a call as they are experienced and trained to assist you.

I want you to love this Model 3 system. I've been in this industry since 1976 and have never stopped trying to make products better. So let me know what you'd like improved....AND what you love.

Art Hird
President
TORXUN

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MODEL 3 INTRODUCTION

- A.1 Product Registration
- A.2 Pictorial Index
- A.3 General Product Description
- A.4 Product Specifications and Technical Data
- A.5 Operator Category and Usage Class
- A.6 Operator Safety
- A.7 General Safety Instructions on Automated Gates

A.1 PRODUCT REGISTRATION

Date Today:_____

Product Information

Model Name/ Number	
Serial Number	
Purchase Date	
Installation Date	
Distributor's Name	
Distributor's City	

Installer Information

Company Name	
First Name, Last Name	
Street Address	
City	
State	
Zip Code	
Telephone	
Email Address	

End User Location & Information

First Name, Last Name	
Company/ Association	
Street Address	
City	
State	
Zip Code	
Telephone	
Email Address	

Operator and Gate Use

[ ] Residential	**[ ]** Commercial/ Multi-Family
[ ] Restricted Access Facility	**[ ]** Parking Spaces Inside Garage

Fax or Email this completed form to:

TORXUN ™
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Email: sales@TORXUN.com

A.2 PICTORIAL INDEX - THE MODEL 3 Operator

Fig A.2.1 Model 3 Operator (Tower)

Main components housed inside the tower are:

- DC Drive motor
- Drive-gear box
- Drive shaft clutch or chain link
- Upper actuating (swing) arm
- Lower actuating (swing) arm
- 24 V DC Battery
- Operator control cabinet
- APEX II control module

Access to the components are through the upper and lower service access panels shown.
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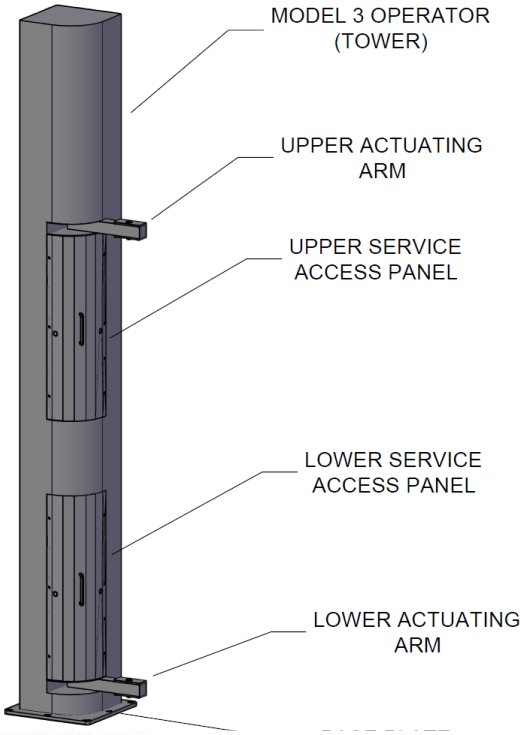
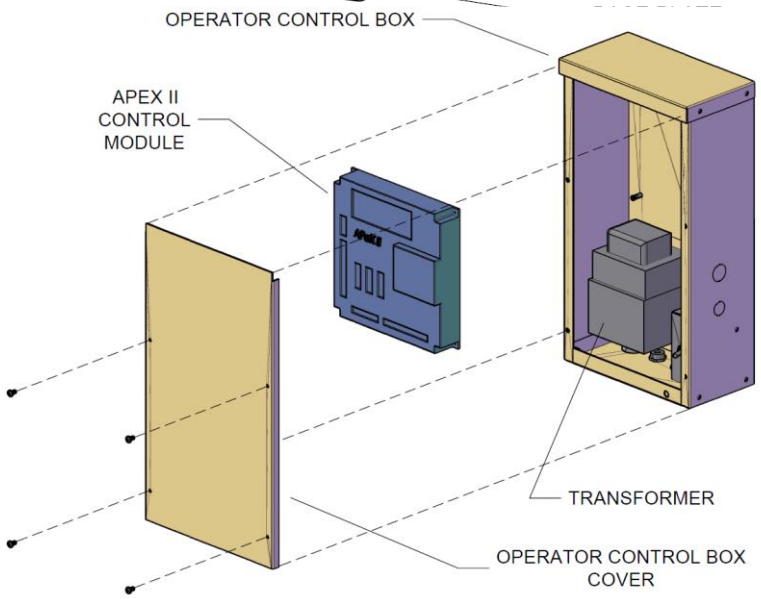


Fig A.2.2 Control cabinet & Apex II Module

The main brain of the operator is the APEX II control module housed inside the operator control cabinet along with the battery and related electrical components.

All function features of the Model 3 operator is programmed and controlled by the APEX module. The cover plate of the operator's control cabinet is removeable to provide access to the Apex unit, service battery and other electrical components.



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A.3 GENERAL PRODUCT DESCRIPTION

The TORXUN ™ MODEL 3 Swing Gate System™ is engineered and manufactured taking into consideration the requirements for strength, reliability, and appearance, while at the same time delivering a cost-effective product designed for commercial, industrial and multi-family applications where continuous operations are required.

The MODEL 3 is manufactured using the most modern fabricating techniques and components. Highly skilled and experienced craftsmen, working to precise specifications incorporating the fabrication method known as “slot and tab,” guarantee the precise location and orientation of all welded assemblies, ensuring trouble free mechanical movement. All welding is performed by certified welders adhering to American Welding Society standards.

TORXUN ™ uses the finest materials. The MODEL 3 tower is formed from A36 hot rolled structural steel plate, rated at 36,000 pound tensile strength and the access doors are manufactured from A1011 Cold Rolled Steel.
All MODEL 3 towers, including the towers’ internal parts are “clean baked” at 220 degrees to burn off any residual oil from difficult to reach areas. Finally, the MODEL 3 is primed with a zinc undercoat for harsh-environment protection and finished with a high-durability powder coat paint.

A.4 PRODUCT SPECIFICATIONS AND TECHNICAL DATA

MODEL 3 TOWER

Construction:	A36 hot rolled structural steel, 3/16" gauge, welded
Finish:	Clean baked, zinc primer, powder coated top coat
Standard Heights:	120” (other custom heights available)
Outside Dimensions:	12” x 12”
Base Mounting Plate:	16-3/8” X 16-3/8” with 8x 5/8” Slotted mounting holes

DRIVE MOTOR & MECHANICAL OUTPUT

Description:	1/3HP 1800RPM 24V 13 amps motor
Max Current Draw:	13 Amps
Gate swing:	100 degrees
Opening time at 90°:	Standard: approximately 13 seconds
Fast option:	approximately 7 seconds; adjustable soft start and stop.

OPERATIONAL LIMITS

Maximum gate weight:	1200 lbs[1]
Maximum Gate width:	24 feet[1]
Maximum Gate height:	15 feet[1]

[1] see section B.7 Vehicle Gate Construction for Model 3 Operator

A.5 GATE OPERATOR CATEGORY AND USAGE CLASS (UL325)

- The TORXUN Model 3 operator, per UL 325 Safety Standards, falls in the Swing Gate and Vehicular Barrier Arm category for gate operators. The Usage Class of the application of a gate system is determined by the area that the vehicle gate services. UL325 defines four Usage Classes as follows. TORXUN Model 3 operator is appropriate for all four classes:
- **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 I 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), hotels, garages, retail store, or other building servicing the general public.
- **CLASS III**: INDUSTRIAL I 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 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.

A.6 GATE OPERATOR SAFETY

Safety notes on the use of the MODEL 3 Operator

- Use this equipment only in the capacity for which it was designed. Any use other than that stated should be considered improper and therefore dangerous.
- When using the Model 3 or any electrical equipment observe some fundamental rules:
- Do not touch the equipment with damp or moist hands or feet.
- Do not install or operate the equipment with bare feet.
- Do not allow small children or incapable persons to use the equipment.
- If a gate system component malfunctions, turn off the main power before making any attempt to have it professionally repaired.
- Do not attempt to impede the movement of the gate. You may injure yourself or damage the equipment as a result.
- This equipment may reach high temperatures during operation; therefore, use caution when touching the external housing or internal components of the operator.
- Learn to use the manual release mechanism according to the procedures found in this installation manual (section C.2.3).
- Before carrying out any cleaning or maintenance operations, disconnect the equipment from the electrical supply.
- To guarantee the efficiency of this equipment, the manufacturer recommends that only qualified personnel periodically check and maintain the equipment.

A.7 GENERAL SAFETY INSTRUCTIONS ON AUTOMATED GATES

WARNING: TO REDUCE THE RISK OF INJURY AND DEATH, READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY!

- Never let children operate or play with gate controls.
- Keep remote controls away from children.
- The vehicle entrance is for vehicle use only.
- Pedestrians must use a separate entrance/exits.
- Always keep people and objects away from the motion path of gates
- No one should cross the path of a moving gate.
- Test the gate operator monthly for reliability and safety.
- The gate must stop or reverse when an object obstructs the non-contact sensors.
- After adjusting the force or the limit of gate travel, retest the gate operator.
- Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
- Use the emergency release on operators and gate systems only when the gate is stuck nd AC/DC power must be turned off.
- Keep gates properly maintained.
- Read the owner's manual for gate safety and proper operation.
- Troubleshooting and repair of gate systems must be handled by qualified gate service technicians.
- Save these instructions.

SECTION B

QUICKFOLD SYSTEM INSTALLER'S GUIDE

Refer to **Appendix I : Mounting, Alignment, and Installation Guide** of operator-gate system for guidance and instructions on how to align, level, and square the Model 3 operator to the gate line and/or to a secondary operator (in the case of biparting gate systems), including instructions on how to mount gate panel(s) to the Model 3 operator and to pull LV and HV wiring into the Model 3 operator.

The rest of this section provide information and guidelines about installing and operating an automated gate system involving the TORXUN Model 3 operator:

- B.1 Swing Gate Systems and Standards
- B.2 Typical Installations of Swing Gates
- B.3 Installation planning
- B.4 Operator-Swing Gate Installation
- B.5 Access Control
- B.6 Entrapment Protection and Obstruction Control
- B.7 Vehicle Gate Construction for Model 3 Operator
- B.8 Folding Mechanism and LockDock for Bifold Gate
- B.9 Foundation and Footing Guidelines
- B.10 Electrical
- B.11 Programming The Operator (APEX II Control Unit)
- B.12 Operational Test
- B.13 Commissioning and Turnover to End-User

B.1 SWING GATE SYSTEMS AND STANDARDS

B.1.1 Description of Gate Configurations

Single Swing	single panel gate attached to one operator	Fig B.1
Bi-Parting Swing	two sets of panel gates attached to one operator each working in tandem with the other such that one gate set acts as a primary system and the other as secondary	Fig B.2
Single Bifold Gate	a set of a two-panel gate where one panel folds onto the other	Fig B.3
Double Bifold Gate	two sets of the single bifold gate	Fig B.4

Fig B.1.1.a Single Swing Gate

Fig B.1.1.b Bi-Parting Gate

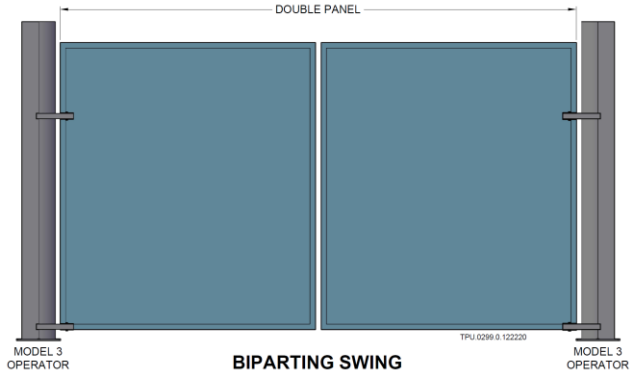


Fig B.1.1.c Single Bifold Swing Gate

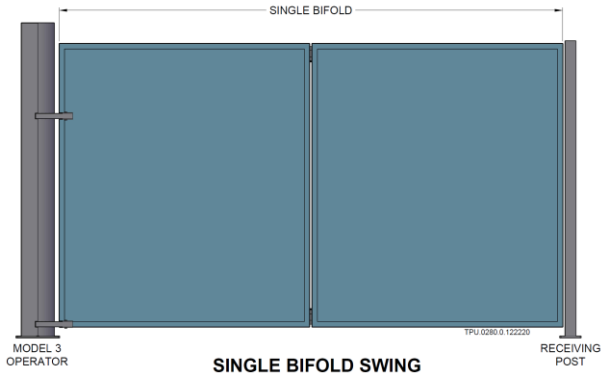
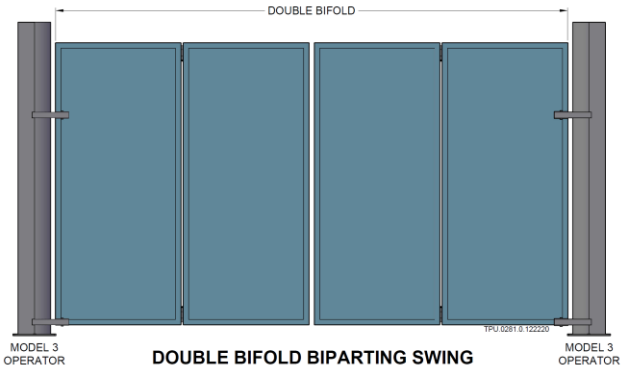


Fig B.1.1.d Double Bifold Bi-parting Gate



B.1.2 Folding Mechanisms

Track Folding System (Torxun FlexGuide)	refers to a track guide, usually overhead, that guides one of the bifold panels to fold onto the other	Fig B.1.2.a
Trackless Folding System (Torxun FlexArm)	refers to a trackless mechanism that folds one of the bifold panels onto the other panel	Fig B.1.2.b

Fig B.1.2.a Guided Folding System (FlexGuide)

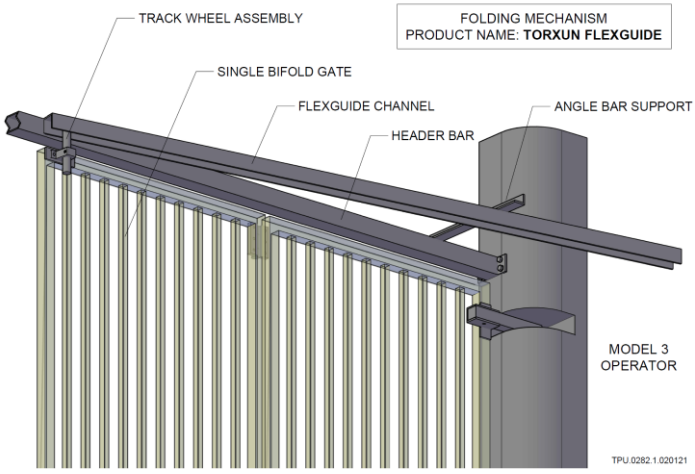
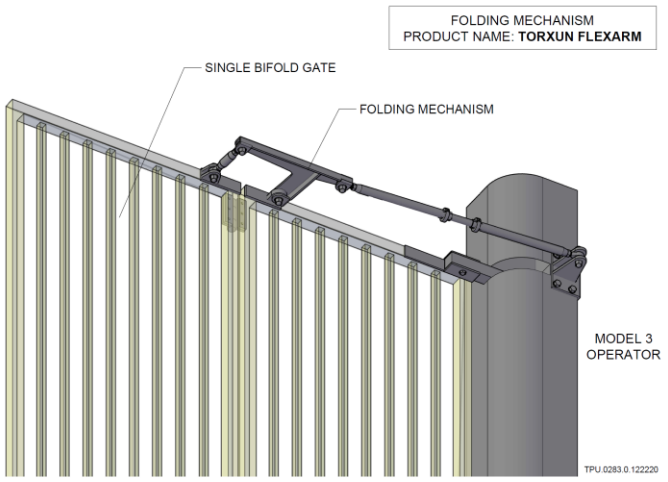


Fig B.1.2.b Trackless Folding System (FlexArm)



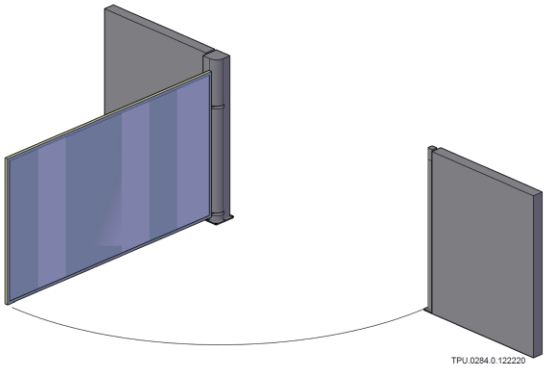
B.2 TYPICAL INSTALLATION

B.2.1 Swing Direction

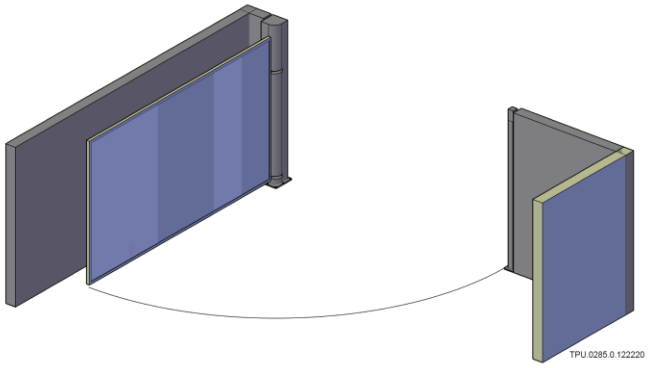
Swing gates either open to open spaces; Fig B.4.1, or open parallel to walls, building or similar structures; Fig B.4.2., For the most part, swing gates are installed situated on level grade. However, bias-grade installations should give due consideration to the design of the gate frame vis-a-vis the swing path of the gate panels.

Typical installations apply to both single swing or biparting, single or double panel (bifolds) swing gates. Consider the aforementioned conditions as well to properly locate and install related gate access controls, obstruction controls, entrapment controls, warning signages and visual aids.

B.2.1.a Swing Gate Opens to Empty Space

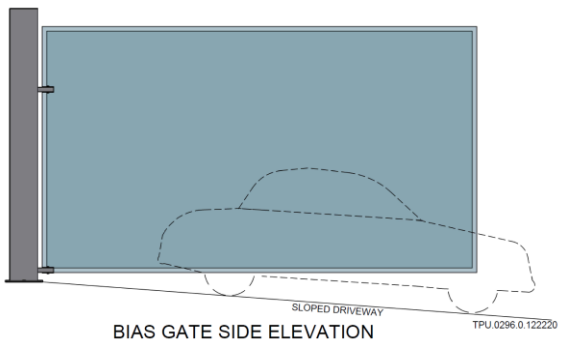


B.2.1.b Swing Gate Opens to Structures



B.2.1.c Biased-Gate (Sloped Roadway and Sloped Driveway)

BIAS GATE FRONT ELEVATION



BIAS GATE SIDE ELEVATION

B.3 INSTALLATION PLANNING

The following are general guidelines in the planning, layout and construction of a Model 3 operator-swing gate system.

B.3.1 Vehicle Swing Gate Design

The Model 3 operator is intended and designed only for use on vehicle swing gates. Design the vehicle gate mindful of how it will attach to the Model 3 operator. Refer to Section B.7 of this manual for guidelines on gate construction, weight and size limits. Refer to Section B.7.5 of this manual and Section E of APPENDIX I on how to mount a gate unit to the Model 3.

B.3.2 Vehicle Gate Location (Entry and Exit)

Locate the gate such that people will not come in contact with the vehicle gate during the entire path of travel of the gate. The vehicle gate must be installed in a location with enough clearance between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swing gates shall not open towards public domain or access areas.

The gate must be properly located and installed to function freely in its intended direction(s) in manual mode prior to the engagement with the operator.

B.3.3 Electric Power Supply (AC and DC)

A dedicated AC power source with circuit breaker protection from the building main is required to provide power to the operator-gate system. The power source is branched out to a field electrical panel with its own disconnect and breaker device at the local area of the operator-gate unit.

Note: DC volt electrical wiring must not exceed 50’ of total run between operator to operator in a biparting swing gate

All electrical work to be performed by certified professional electrician/ electric installation provider in compliance to NEC codes and applicable state and local electrical code. Field panel enclosures are under NEMA standards.

B.3.4 Access Control (see Section B.5)

B.3.5 Entrapment Protection and Obstruction Control (see Section B.6)

B.3.6 Vehicle Gate Warning Signages

A Minimum of two (2) Warning Signs shall be installed on the gate panels so one is visible from either side of the gate system.

B.4 OPERATOR-SWING GATE INSTALLATION

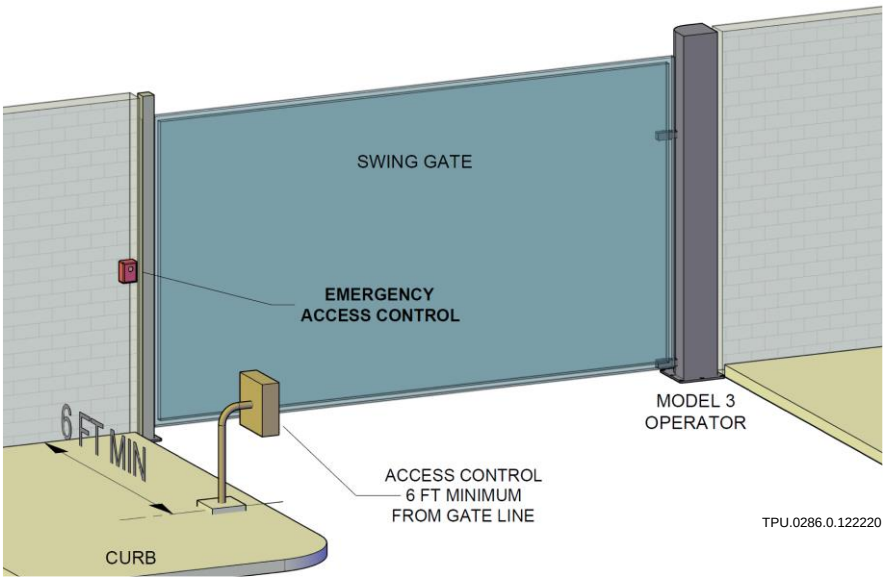
Note: Refer to Section B.7 for general guidelines on the construction of a single panel or a bifold panel swing gate;
Refer to Section B.7.5 and Section E of APPENDIX I for instructions on how to mount, align and Install a swing gate to the Model 3 Operator.

B.5 ACCESS CONTROL (Gate Entry & Exit)

B.5.1 Fixed or permanently located Access Control

Install Entry and Exit access controls like card readers and entry keypads at a minimum of six(6) feet away from any moving part of the gate and locate it where the user is prevented from reaching over, under, around or through the gate to operate the controls.

Fig B.5.1 Typical gate access control placement



The exception are emergency access controls (EAC) meant for authorized personnel only (e.g. fire, police, EMS); Install EACs at eye-level on the public side of the property.

B.5.2 Minimum Requirement to Install Access Controls

Depending on the type and model of access control devices to operate the Model 3 operator, the minimum requirements to install gate access and control system are as follows:

B.5.2.a Location and orientation of the device (keypad, card reader, tags, etc.) – consider requirements on distance from the gate system and operator depending on use; i.e.: gate entry or gate exit.
B.5.2.b Type of control - differentiate between use as either access control or obstruction control.
B.5.2.c Routing of electrical conduit and wiring to connect between access control and gate operator; see limits on wire-runs in Table B.10.1 Electrical.
B.5.2.d Warning signages and placement thereof – visibility of signages relating to public access entry or exit.

B.6 ENTRAPMENT PROTECTION AND OBSTRUCTION CONTROL

B.6.1 Pedestrian Entrapment

Pedestrians must be routed to a separate man gate. Sensors are still required in order to provide a degree of protection should anyone stray into the area of an automatic gate. Generally, there are two types of external sensors that may be used: non-contact type sensors like photoelectric eyes and contact sensors such as edge sensors.

Below is the UL325-2020 standard specifying the types of entrapment protection systems which must be in place for an operator and gate system to be compliant.

Table A UL325-2020 Minimum Quantity of Entrapment Devices

	Swing Open	Swing Close
Single or Biparting Swing Single or Double Panel	2*	2*
* At least two independent entrapment protection are required in each direction of travel. Except, if there is no entrapment zone in one direction of travel, only one entrapment protection device is required in that direction of travel; however, the other direction must have two independent entrapment protection devices.		

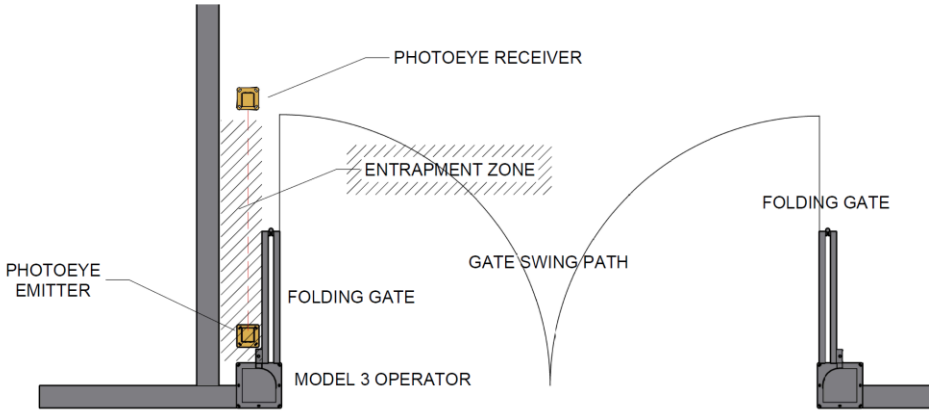
Table B Required Entrapment Protection for Swing Gates as of 2/28/2020

Type A	Inherent entrapment protection system
Type B1	Non-contact sensor (photoelectric sensor or the equivalent).
Type B2	Contact sensor (edge device or equivalent)

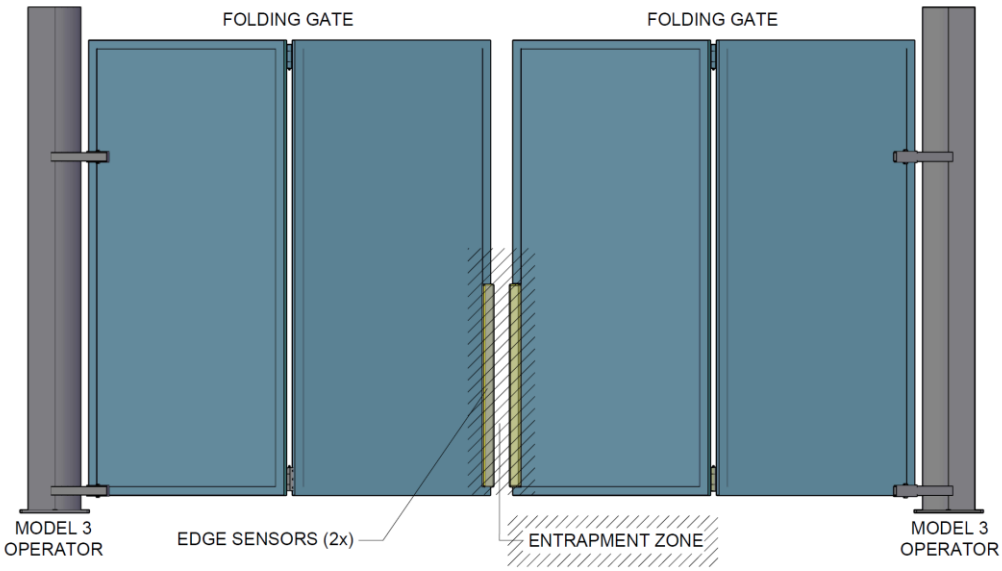
Current industry standards require the use of either or both of these sensor devices in all Classes (I, II, III, IV) of installations because the general public is likely to be present. Although there are alternatives for Class III and IV installations, we highly recommend the use of external sensors for all automatic gate applications.

The installer may choose either photoelectric eyes or edge sensors, or use these devices in combination, but both the open and closing directions of gate travel must be guarded. Study the entrapment protection schematic and consider your specific installation to determine where the greatest risk of entrapment exists. Locate the edge sensors and/ or the photoelectric sensors accordingly. Be certain that a sufficient number of sensors are used so that both directions of gate travel are guarded.

Fig B.6.1.a Typical Photoeye placement used as non-contact entrapment protection



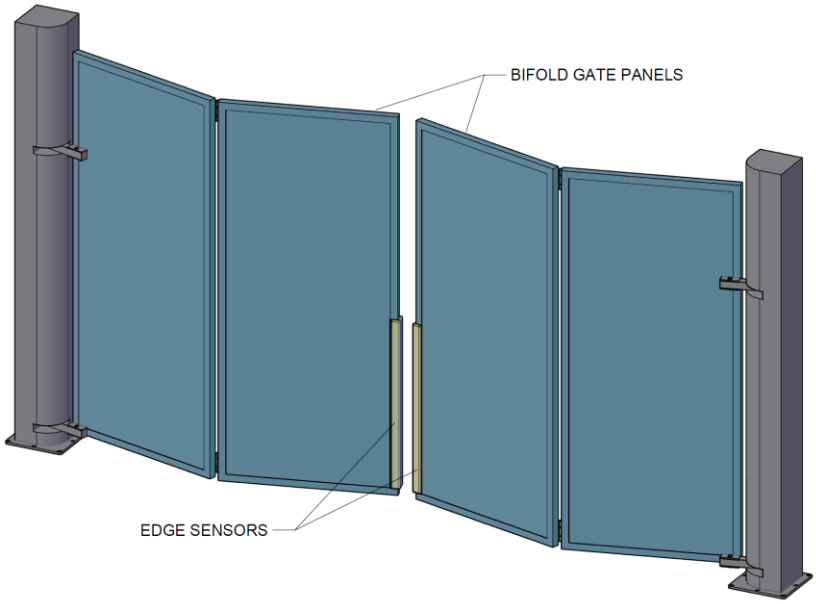
B.6.1.b Typical Edge Sensor placement used as contact entrapment protection



Mount the edge sensor following the manufacturer's instructions. If the gate bottom clearance is more than 4 inches above the ground an edge sensor must be mounted on the bottom edge.

The Edge Sensors have two variants, wired type and wireless type. The wired model is hard-wired from the edge sensor unit to the Model 3 operator control cabinet with the cabling typically laid out along the edges of the gate panel; Fig a

Fig a Typical Wired Edge Sensor placed on the vertical leading edge of the gate panels

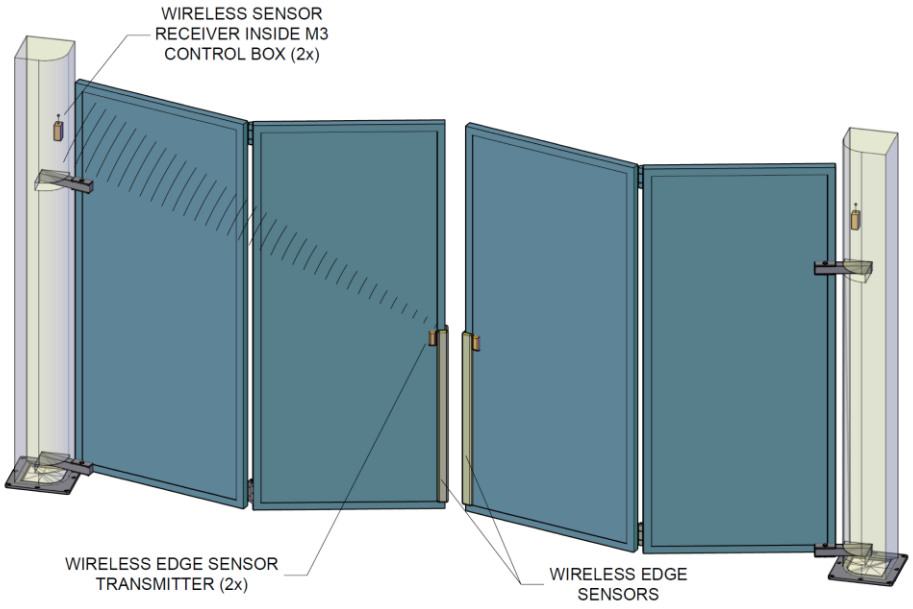


The wireless variant has a transmitter and a receiver module. The transmitter is installed beside the edge sensor on the gate itself while the receiver unit is mounted inside the Model 3 operator; Fig b.

In choosing wireless edge sensors as external entrapment device, be aware of the environment around it and know that RF interference from outside sources can drastically diminish range and performance of wireless devices. Airports, police stations, fire departments, hospitals, and other sites with a radio traffic give off a lot of RF noise.

Install the transmitter in a way that it is in direct line of sight with the receiver's antenna throughout gate motion. Limit the distance between transmitter(s) and receiver(s) to what is specified by the manufacturer.

Fig b. Typical Wireless Edge Sensor with Transmitter and Receiver modules



B.6.2 Obstruction Control

B.6.2.a Vehicle Loop Detection as Obstruction Control

Loop detection system is typically used in automated gate applications to prevent a gate from automatically closing on a vehicle or to automatically open the gate when a vehicle is entering or exiting a property.

Plan and locate the vehicle loop detection in reference to the gate swing path as well as the entry and/or exit drive path. Specific dimensional proximities and size of loops are required to ensure the efficiency of the system. Loop configurations differ depending on the application. Detection loops have to be installed watertight in order to prevent false or inaccurate readings.

Swing gates typically require the following usage of ground loops:

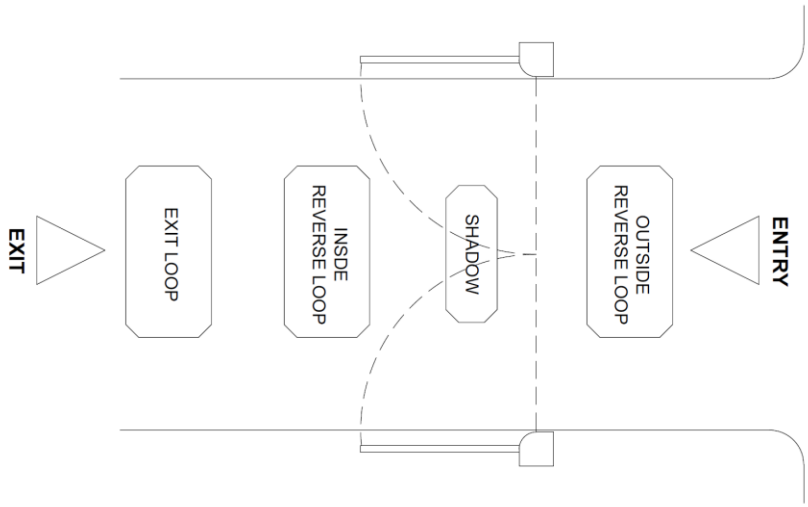
- Outside Reverse or Entry Loop: The entry loop opens the gate when a vehicle (obstruction) drives over the loop; holds the gate open while the obstruction is present; and/or reverses a closing gate if and while a vehicle is detected over it; i.e.: a vehicle entering, stopping momentarily before finally moving on.

- Shadow Loop: The Shadow Loop is placed under the path of a swing gate. This loop checks for obstruction to the gate swing path before initiating gate action; i.e.: closes and/or opens the gate if a vehicle (obstruction) is detected or not across the swing path, if a vehicle is within the swing path the gate will not move. In a typical swing

gate, there is a considerable space of undetectable area between the inside and outside reverse loop that a vehicle can fit in to, thus the importance of the shadow loop.

- Inside Reverse or Exit Loop: The exit loop will initiate to open and hold the gate open when a vehicle (obstruction) is detected; or reverses a closing gate if a vehicle is detected present along the path of the swing; i.e.: a vehicle exiting the property waiting for an opening to pull out of the driveway and is not able to exit quickly.

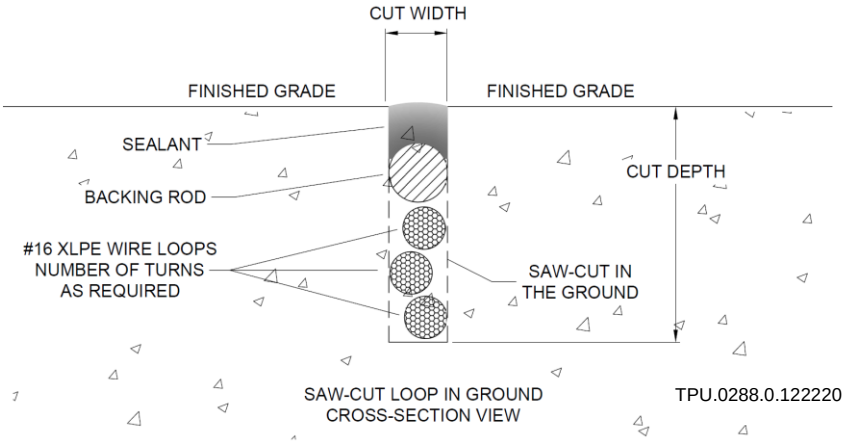
Fig B.6.2.a Control loops typically installed in a swing gate system



B.6.2.b Components of the vehicle loop detection for obstruction control

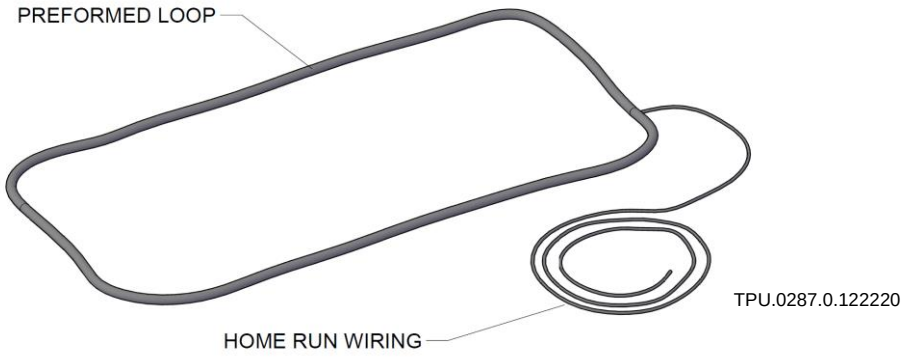
The loop control system employs a detector unit and a length of ground Loop wires (jacketed coils of wire). The loop detector module is factory installed in the Model 3 operator and works with the operator's control board to operate in tandem with signals from the ground loops. The control board and loop detector module determine the actions of the operator and therefore the gate when the presence of a vehicle (obstruction) is detected.

B.6.2.c Basic Types of Loops:



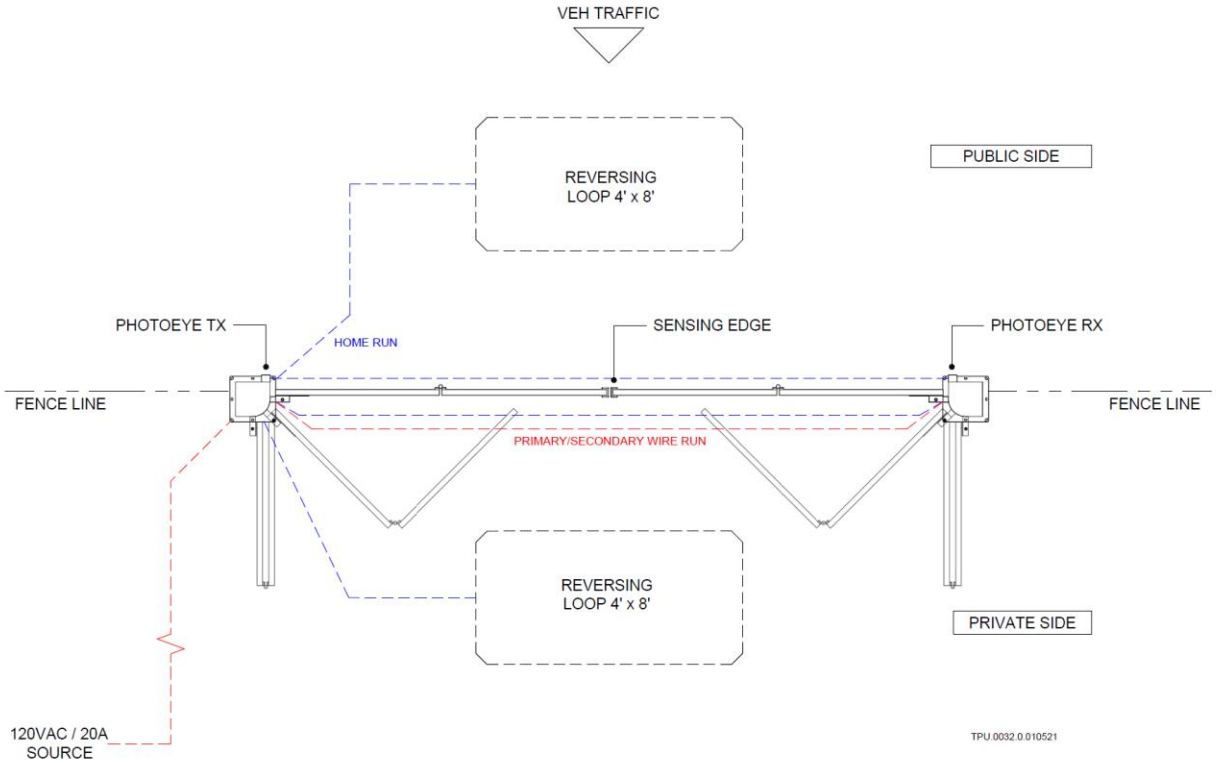
- Saw-Cut Loops: for installation to existing driveways or drive paths. The finished grade is cut to a rectangular pattern with standard dimensions (i.e.: 4' x 8'). The width and depth of the cut are specified. The continuous loop wires are laid down in the trench one loop layer at a time on top of each other. The home run wire connected to the ground loop is laid out in another trench leading up to terminate at the detector unit in the operator. The cut on the ground is filled with sealant embedding the loop and home run wires watertight.

- Pref-formed Loops: prefabricated ground loops in standard sizes installed in place before the vehicle pathway or driveway is paved with a surface finish (i.e.: concrete, asphalt, etc.) The loop is laid down on the pathway configured in a standard rectangular pattern and secured in place with guide pins. The home run wire which is connected and sealed to the preformed loop is laid out on the ground leading up to terminate at the detector unit in the operator.



B.6.2.d Vehicle Detection Loop Layout

Fig B.6.2.d Vehicle Detection Loop Typical Layout

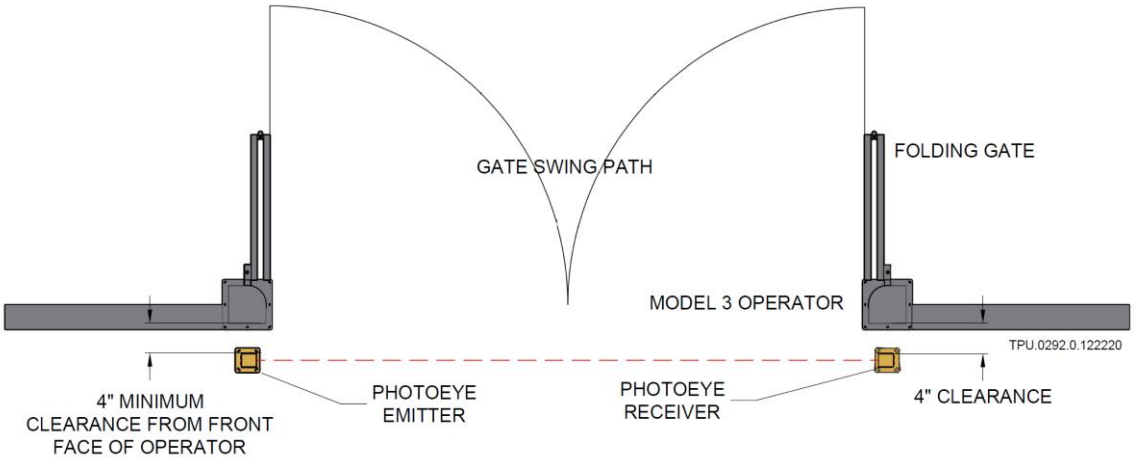


For both types of loops, the home run wire between the ground loops and the loop detector runs through a conduit buried in the ground. It is imperative that the entire home run wire and ground loops themselves be installed watertight.

B.6.2.e Photoeyes as Obstruction Control

There are two common types of photoelectric sensors, through beam and retro reflective. A through beam sensor is generally more powerful and able to function reliably with dirty optics and in poor weather. A retro-reflective sensor has the convenience of not requiring the installation and electrical wiring of the remote emitter required in a through beam system but is generally more problematic in poor weather. Avoid use of a retro-reflective device to span a distance greater than 24 feet in an outdoor environment to unsatisfactory performance.

a. Typical Photoeye placement as obstruction protection



Most photo eyes require careful optical alignment to aim the emitter beam to the center of the receiver or reflector. To avoid false triggering, it is important to carefully align the system, especially with retro-reflective photo eyes. The best way to assure true centering of the beam is with trial testing where the emitter is shifted to move the beam left and right and up and down until the range of the invisible cone of the infrared beam is known. Photo eyes usually provide alignment aid LEDs for this setup, but they can be hard to see.

Notes about retro-reflective systems: Correct installation and alignment of a retro-reflective photo eye and its reflector is important for a trouble-free installation. Any system operating at a range greater than 16 feet is more prone to false triggering due to dirty optics, condensation, or poor weather. If care is taken in the initial mounting and alignment of the reflector the chance of problems is greatly reduced.

Taking steps to protect the photo eye and the reflector from being exposed to fog and being certain the photo eye is perfectly aligned will greatly reduce any false triggering of the system. The ideal mounting of a retro-reflective photo eye is inside an enclosure of some sort.

Photoeyes for obstruction control are installed on the public side of the gate. It requires a minimum installation height of 21” above ground and must be at least 6” away from the face of gate panels.

Note: A requirement of the UL 325 standard is that a photoelectric sensor be laboratory tested, "recognized” under UL 325 and compatible with the TORXUN Model 3 operator.

B.7 VEHICLE GATE CONSTRUCTION FOR MODEL 3 OPERATOR

B.7.1 ASTM F2200 Standard for Gate Construction

Vehicular gates must be constructed and installed in accordance with ASTM F2200 Standard Specification for Automated Vehicular Gate Construction. For a copy of this standard contact ASTM directly at 610-832-9585, service@astm.org, or www.astm.org. For reference sheets for UL325 and ASTM F2200 visit DASMA (Door and Access Systems Manufacturers Association) http://www.dasma.com/dasma-pages/DASMA-tehnical-data-sheets.asp

B.7.2 Maximum Gate Weight for Model 3 Operator

Maximum gate weight is the total weight of all parts and materials incorporated in the gate:

- framing, webbing, and gusset plates
- reinforcement cross bars or stiffeners
- solid panels and kick plates (square footage and gauge thickness)
- pickets (length and gauge thickness)
- hinges (i.e.: bifold gates)
- ornaments, monograms, and emblems
- mesh or screens and cane bolts

The maximum gate weight for use with MODEL 3 Operator is **1200 lbs.**
MODEL 3 Operator aggregate weight is **525 lbs.**

B.7.3 Maximum Gate Width, Maximum and Minimum Gate Height

Gate Type	Maximum[2] Allowable Width	Maximum Allowable Height	Minimum Standard Height[3]
Single Swing Gate	14’	15’	6’ 9-7/8”
Bifold Swing Gate	6’-6” per panel	15’	6’ 9-7/8”

B.7.4 Gauge Thickness of Bifold Gate Frames

It is TORXUN’s policy to design bifold gates with the follower panel frame lighter than the lead panel frame. This design lessens the mechanical stress on the folding equipment (TORXUN FlexGuide or FlexArm) and the bifolds operate optimally.

TORXUN: Frame thickness of the follower panel must be 20% lighter than the frame thickness of the lead panel.

B.7.5 Required elements to attach a Swing Gate to the Model 3 Operator

Three elements are required to mount a swing gate (single panel or folding panel gates) to the Model 3 operator Upper and Lower swing arms (actuating arms):

- Backing plates
  Two pieces of 2” x 12” x ¼” steel plates to weld on the upper and lower sections of the gate frame where the operator’s swivel arms will line up to; will serve to reinforce the attachment points on the frame; Fig B.7.5.a

[2] Total length of gate

[3] Contact Torxun for gate height lower than 81.875”

- U-brackets
  Standard TORXUN quick connect brackets bolted at the end of the operator's swivel arms. The U-brackets are welded on to the reinforcement backing plates (not directly on the gate frame) physically connecting the gate unit to the Model 3 operator's swing arm; Fig B.7.5.a

- Weldment Specification
  All weldments' specifications are ¼" fillet welds around the backing plates on the gate frame and around the U-brackets on the backing plates; Fig B.7.5.b

Fig B.7.5.a Backing plate and TORXUN U-brackets

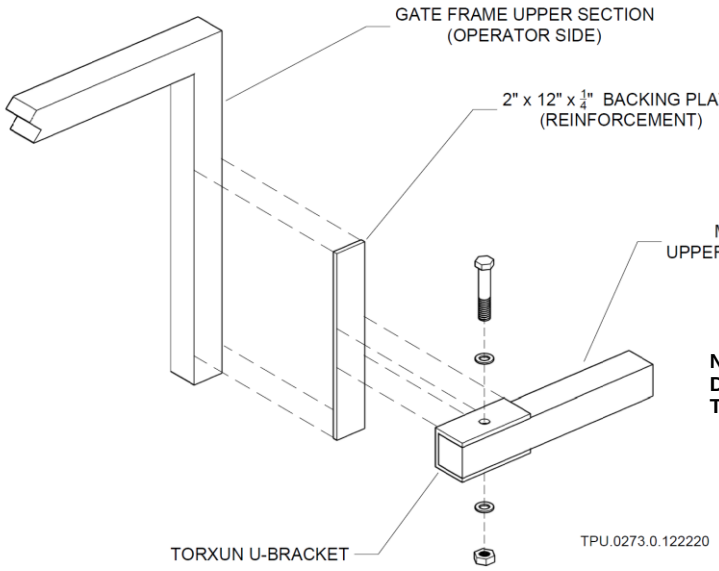
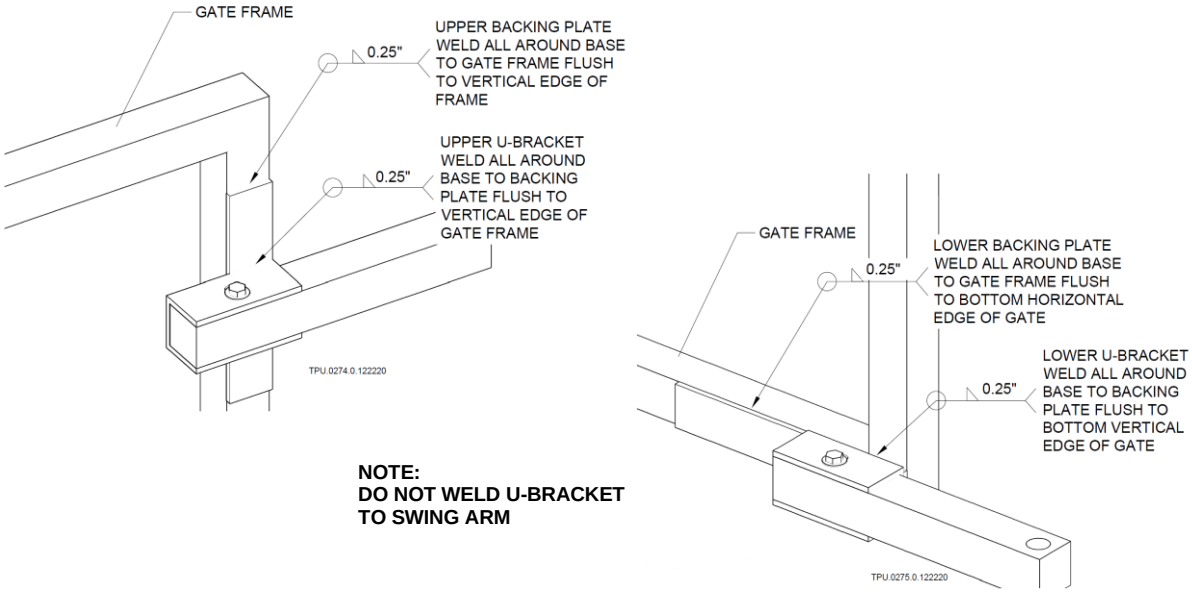


Fig B.7.5.b
Weldment specification



B.7.6 Required measurement clearances to mount swing gate to Model 3 Operator

Observe the proper alignment clearances in mounting a gate panel to the Model 3 operator be it a single or double panel swing or a single or double bifold swing gate.

Fig B.7.6.a Required clearances in mounting gate frame to Model 3 operator.

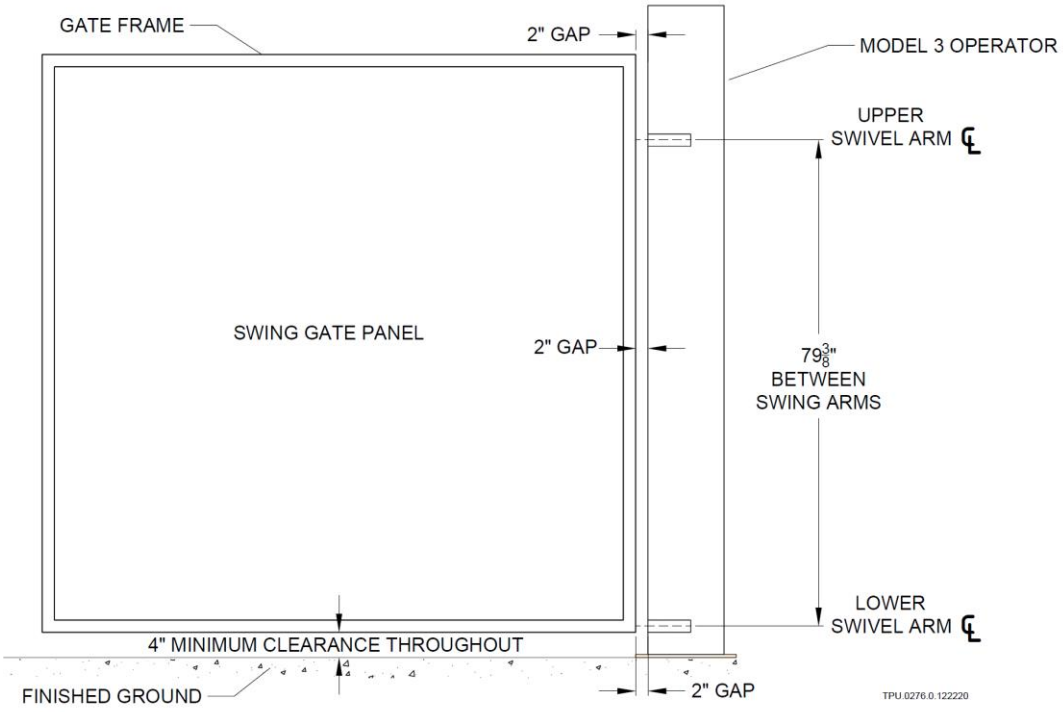
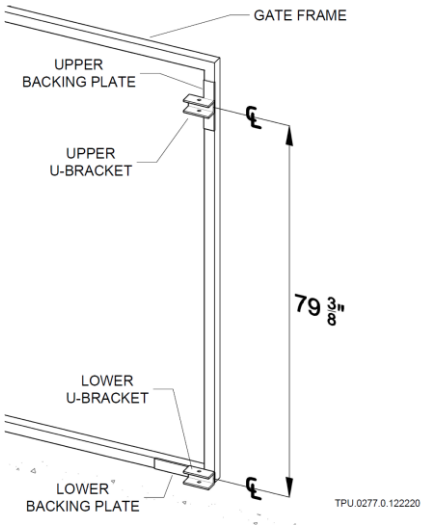


Fig B.7.6.b Maintain 79.375” center-to-center distance between U-brackets.

Note the fix measure of 79-3/8” (79.375”) center-to-center between the upper and lower swing arms of the Model 3 operator and therefore also between the upper and lower u-brackets; consult TORXUN if intended design height of gate frame is lower than 79-3/8”;

Keep in mind the minimum clearance between bottom of gate frame and finished ground is 4”; Fig B.7.6.a



B.7.7 Required elements to attach a Bifold Swing Gate to the Model 3 Operator

A bifold panel swing gate for the Model 3 requires the same three elements of backing plates, u-brackets, and weldment explained in the preceding section B.7.5.

A fourth key element is a hinge system between the folding panels of the bifold, specifically, between the lead panel (panel on hinge side) and the follower panel.

- TORXUN Heavy Hinge (Barrell hinge) - The TORXUN Heavy Hinge is designed specifically for heavy, continuous-use folding gates. Typically installed on bifold gates, the heavy hinge has base mounting plates welded onto the gate frame to where the barrel hinge bracket is bolted on, allowing removal of the hinges without having to grind the welds off the gate frame directly; Fig B.7.7.a and Fig B.7.7.b

Fig B.7.7.a TORXUN Heavy Hinge

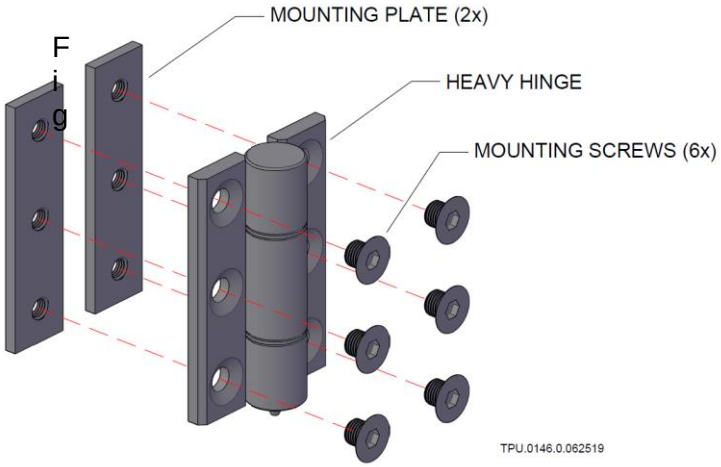
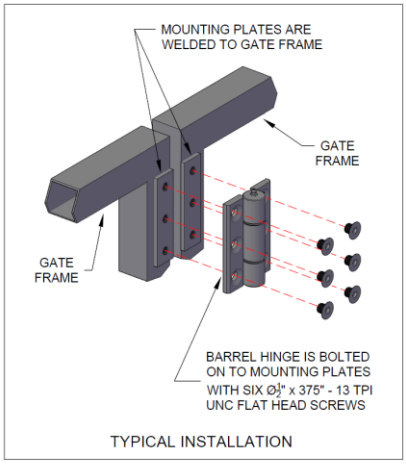


Fig B.7.7.b Mounting plates on frame



B.7.7.c Installation alignment to gate frame

The hinges are attached to the top and bottom sections on the outside of the gate usually facing the public side of the property.

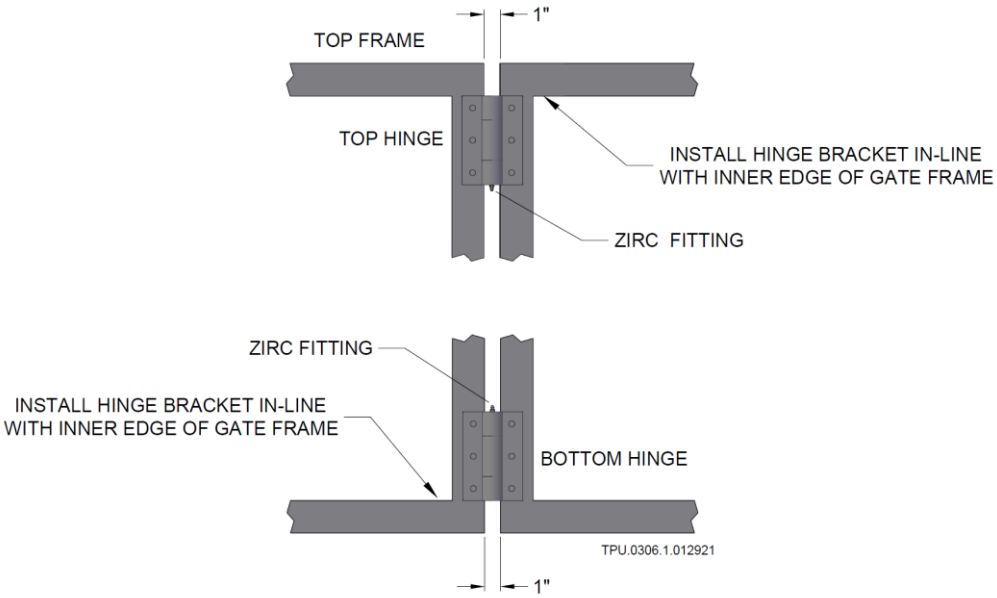
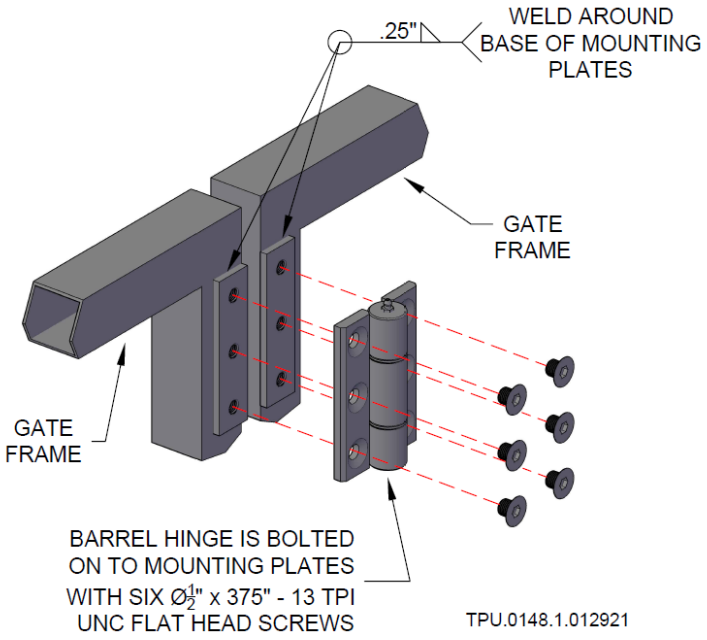


Fig B.7.7.d Weldment Specification



B.8 FOLDING MECHANISM AND LOCKDOCK FOR BIFOLD GATE

B.8.1 Folding Mechanisms

A single bifold or a double bifold swing gate will require a folding mechanism to fold one panel to the other. The panel mounted to the Model 3 swing arms is referred to as the “lead” panel; the second panel is termed the “follower” panel. A barrel hinge between the lead and follower panel connects the panels together. A folding mechanism attached between the lead and follower panel folds the latter to the first,

Torxun offers two types of folding mechanism, the FlexGuide™ and the FlexArm™.

Fig B.8.1.a FlexGuide – The TORXUN FlexGuide system is appropriate where an overhead header, panel or ceiling exists.

See Appendix II for details of installation.

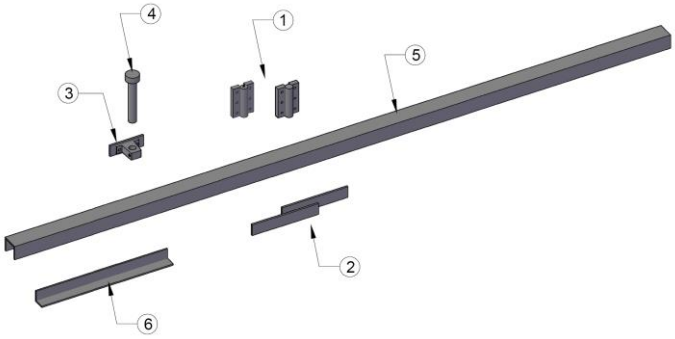


Fig B.8.1.b FlexArm – The TORXUN FlexArm system is appropriate where the gate movement must work without a header; popular in fence-line applications or where installing a guide track is not applicable.

See Appendix III for details of installation.

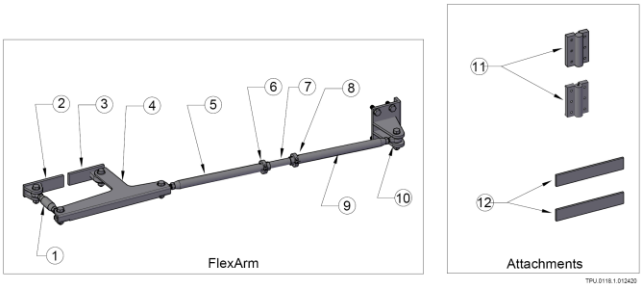
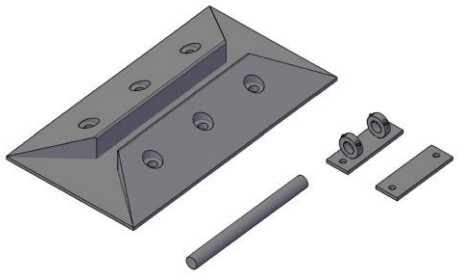


Fig B.8.3.c LockDock – The TORXUN LockDock is a ground yoke designed to “hold” the folding gate in place when they are closed to increase security and prevent them from being pried apart. LockDock is often installed with the FlexArm folding system.

See Appendix IV for details of installation.



B.9 FOUNDATION AND FOOTING GUIDELINES

B.9.1 General Note on Operator Footing Installation

The design and construction of the foundation and footing to support the Model 3 Operator and Gate System is the responsibility of the installation contractor. The foundation and footing must take into consideration the total weight of the operator, gate unit and all other mechanisms added or incorporated to make up the fully operating gate system; i.e.: folding mechanisms in the case of bifolding gates and should be based on calculations provided by a structural engineer and in consideration of applicable local code and site conditions.

Note:

- **Model 3 Operator weight is approximately 525 Lbs.**
- **The maximum aggregate weight of gate unit with elements and accessories incorporated to it is 1200Lbs.**

B.9.2 New Concrete Footing Installations

Refer to the **APPENDIX I: Model 3 Mounting, Alignment, and Installation Guide** for instructions on how to level, align and square the operator to the gate line or to a secondary operator (in the case of biparting gate) before constructing or pouring new concrete footing(s). It is critical for biparting installations (two-operator-in-the-same-opening) that the mounting locations are level across the opening and aligned squarely with each other.

B.9.3 Existing Footing Installations

For existing concrete slabs, consult a local structural engineer to assess the structural integrity of the concrete mass to support the installation of the operator-gate system. Refer to Section B.7 for operator-gate weight and size load limits to consider for foundation and footing design.

Refer to the **APPENDIX I: Model 3 Mounting, Alignment, and Installation Guide** for instructions on how to level, align and square the operator to the gate line or to a secondary operator when installing on existing concrete slabs.

B.10 Electrical

B.10.1 General Information

- Verify AC power supply wires and low voltage (12V & 24V accessory power wires) run through separate conduits. The high voltage (HV) from the AC power supply may cause interference and anomalies in the Model 3 operation if routed together with the low voltage (LV) wires in the same conduit.
- Main HV source to operator must be rated at 120 VAC with 20A circuit breaker.
- Follow NEC and any local requirement on the recommended type of wire to use appropriate to your layout (conduit, burial, etc...)
- Table B.10.1.a shows the maximum allowable wire run from the power source to the operator per wire size (wire gauge); the Model 3 motor is rated at 1/3 hp.

Table B.10.1 Maximum wire-runs vs wire gauge

	120 VAC/12A; 1/3 Hp Operator				
American Wire Gauge (AWG)	#12	#10	#8	#6	#4
Maximum Wire Run* (feet)	130	210	330	530	850

*maximum wire run from AC power source to operator motor

B.10.2 Important considerations for DC-Powered Operators

- Since the operator is intended to run on batteries, control of the load is important. Gates that move easily and do not bind will drain less energy from the battery, preserving capacity for more cycles during a power failure.
- Batteries have a finite life and age more quickly when exposed to temperatures above 80F. As the batteries age, they will progressively lose their capacity to store energy. If the total amount of back up capacity is critical, plan to replace the batteries after two years of use especially in hot climates. Properly recycle used batteries. Refer to Hazardous Materials and Proper Disposal.

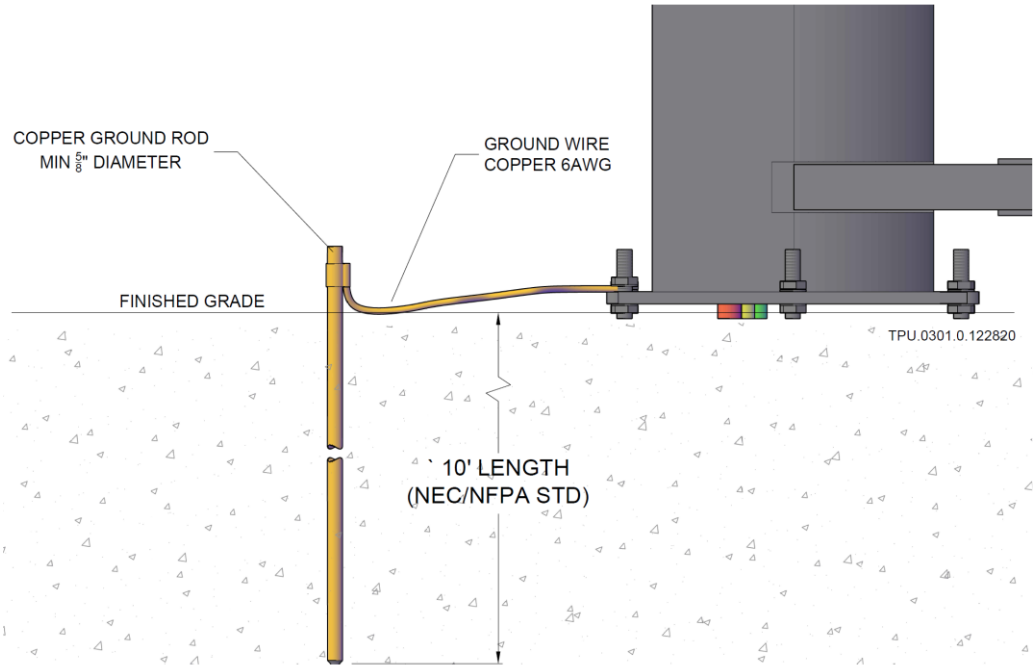
B.10.3 Earth-Ground the Operator Tower

- Establish earth-ground connection: The National Electric Code (NEC) requires a separate earth ground in addition to the required equipment ground to safeguard against potential electric shock to personnel and damage to equipment from lightning strikes. Refer to the National Fire Protection Association (NFPA) 780: Standard for the Installation of Lightning Protection Systems.

  Note: If the Model 3 operator is not grounded with a separate earth ground the TORXUN Warranty is VOID

- Use ground rod of solid copper material, minimum 5/8" diameter and 10 feet in length.
- Drive ground rod to the earth (refer to local codes for proper depth requirements).
- Connect the ground rod to the operator tower with a single length of un-spliced 6AWG copper wire less than 3 feet (91cm) long; Fig B.10.3.a
- Check local jurisdictions for additional code requirements for earth-grounding.

Fig B.10.3.a Earth ground for operator tower



B.10.4 Connect the LV and HV Wires to Operator Control Cabinet Components (see **APPENDIX I** for proper routing of LV and HV wires inside the operator tower)

a. HV Line Connection

- Ensure that AC power is turned off at the main source (breaker panel)
- Feed the main HV source (120VAC/20A) wires from the conduits through the fourth (4th) access hole at the bottom of the control cabinet; Fig B.10.4.a
- Inside the control cabinet, remove the upper and lower Philips screws on the outlet box cover; Fig B.10.4.b
- Connect the 3-wire 120VAC to the pig-tail leads from the toggle switch inside the outlet box; Fig B.10.4.c and Fig B.10.4.d (schematic)

b. LV Line Connections

- Route the LV wires from detector loops, photoeyes, edge sensors and other accessories into the control cabinet through the first (1st) knock-out hole of the cabinet; Fig B.10.4.a
- Feed the LV control wires between primary and secondary operators (for biparting gate systems) through the third (3rd) knock-out hole of the cabinet; Fig B.10.4.a
- Use wire-knots for all connections to terminate to components inside the control cabinet.

Fig B.10.4.a Wire routes to control cabinet

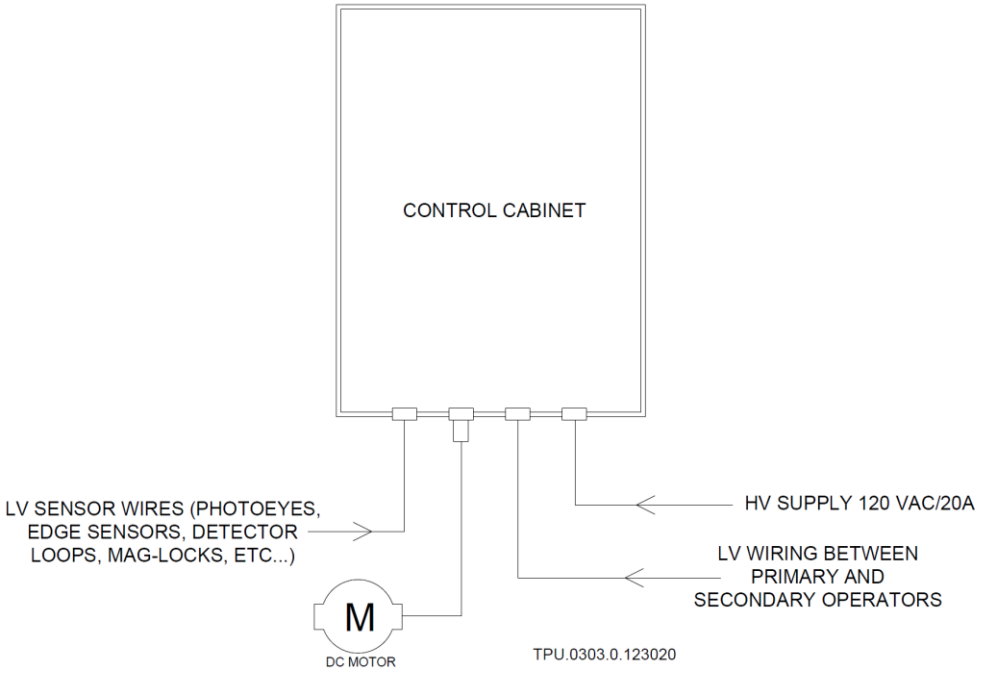


Fig B.10.4.b Service Outlet box inside control cabinet

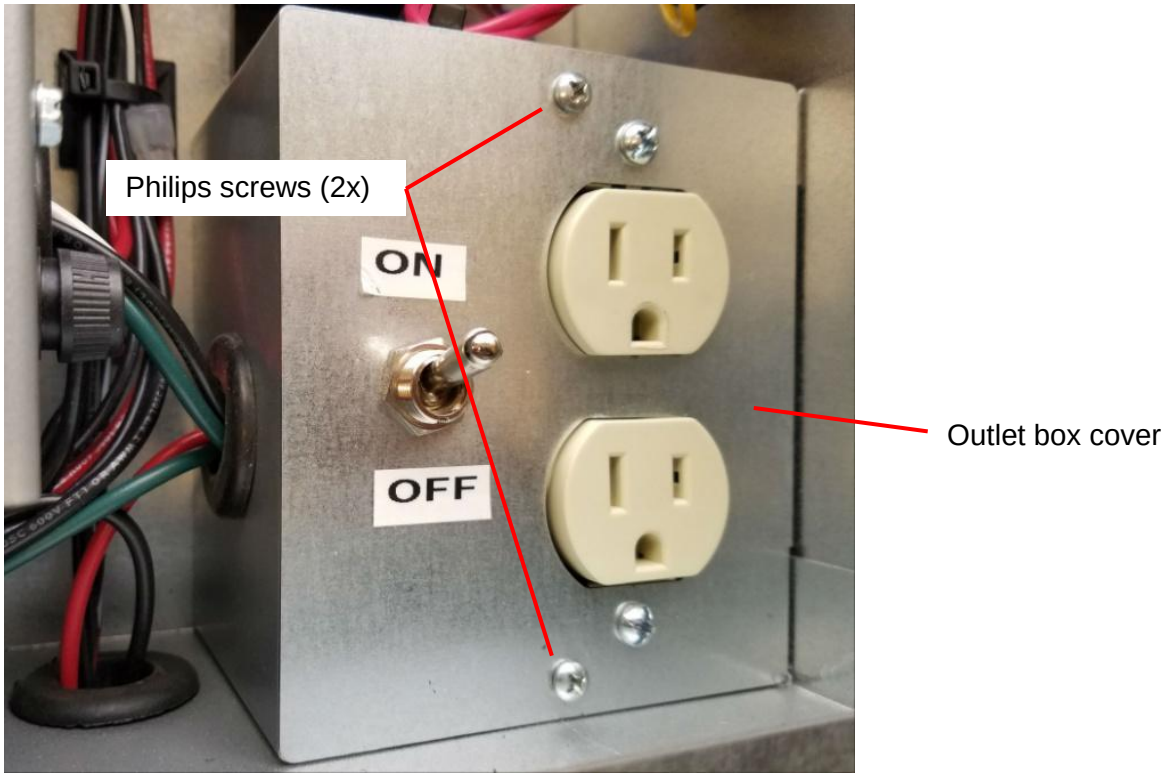


Fig B.10.4.c Connect 120 VAC source wires to corresponding pig-tail connectors (Green, Black, White wires).

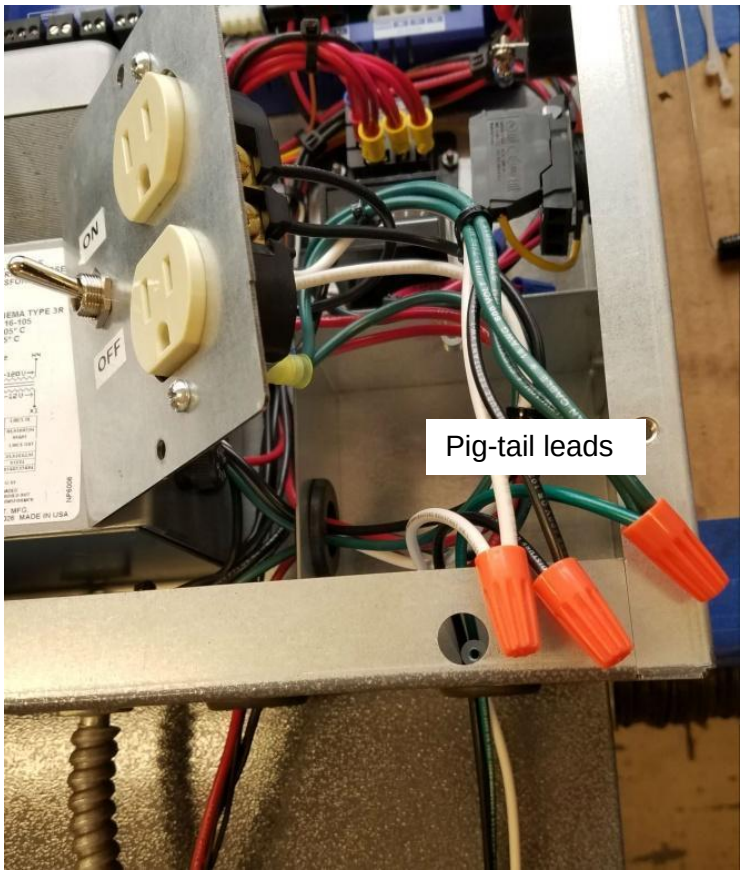
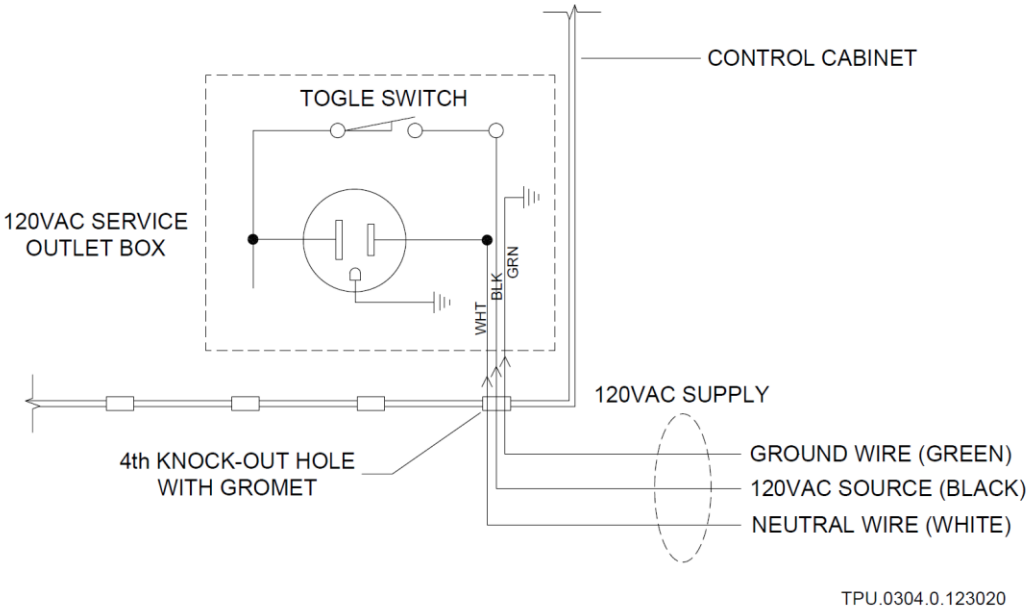
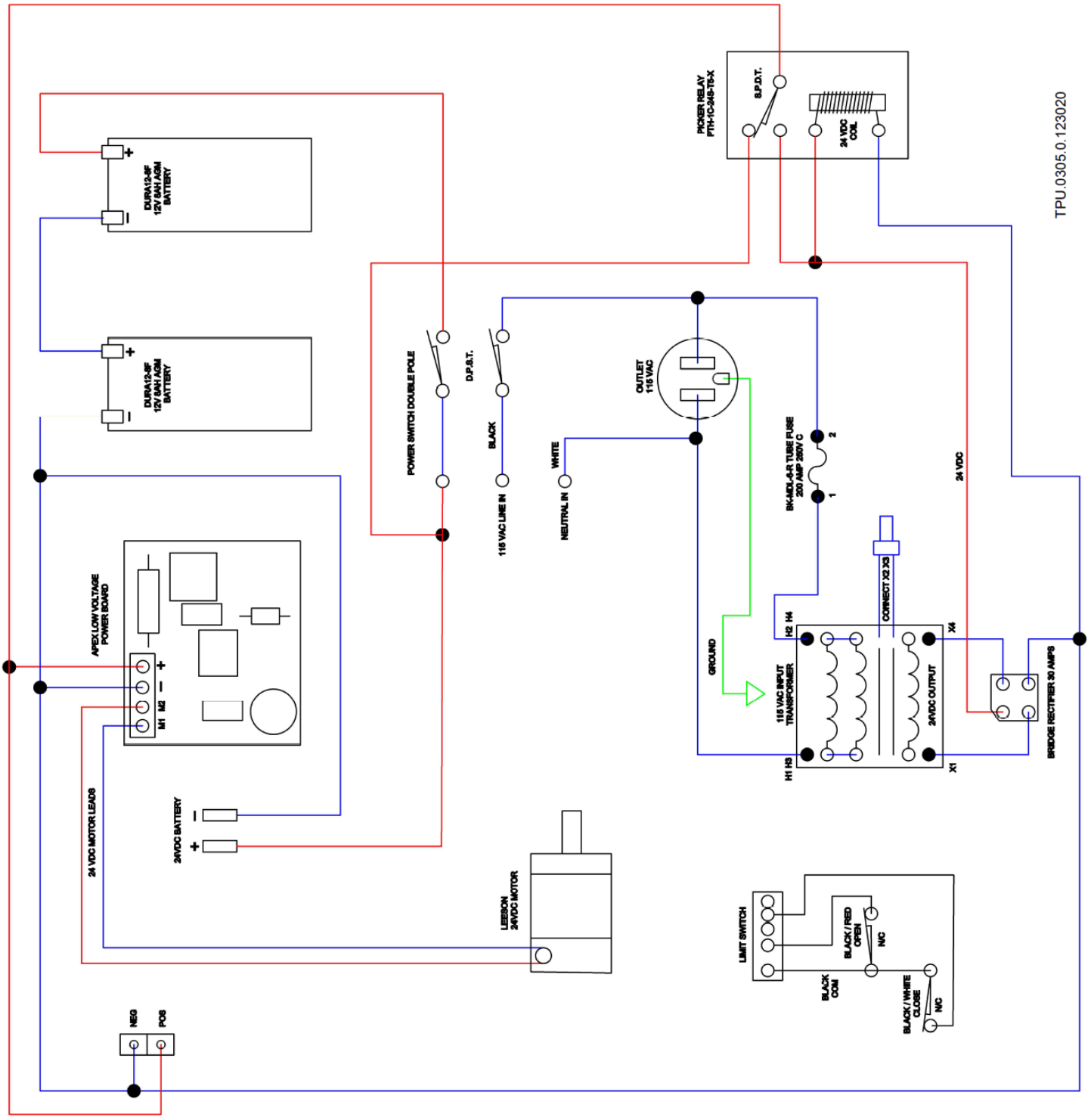


Fig B.10.4.d 120 VAC Connection (schematic diagram)



B.10.5 Schematic Wiring Guide of the Model 3 Operator



B.11 PROGRAMMING THE OPERATOR (APEX II CONTROL UNIT)

B.11.1 Programming Overview

The Model 3 operator's functions and various options can all be programmed using the APEX II Control module. The programming fields are defined as "functions" that have "options". To make setup easier for the installer, the APEX II Controller's programming is divided into two groups: basic and advanced. The basic programming group contains the functions commonly used in most swing gate installations. The advanced programming group contains functions less commonly used (i.e., dual gate stagger delay, maximum run timer, etc.).

B.11.2 Access the APEX II Control module inside the Model 3 operator

Note: Refer to APPENDIX V (Apex II Programming Guide) **for all programming sequences**

Follow the sequence below to access the APEX II Control module inside the Model 3 tower:

1. Remove the upper service access panel of the operator tower by removing eight (8) screws around the cover to access control cabinet; Fig B.11.2.a
2. Remove the control cabinet cover to access the APEX II module; Fig B.11.2.b
3. Find the APEX II module mounted inside the control cabinet.
4. Familiarize yourself with the buttons, display screen, indicator lights and overall layout of the APEX II module; ; Fig B.11.2.c

Fig B.11.2.a Remove Upper Service Access Panel

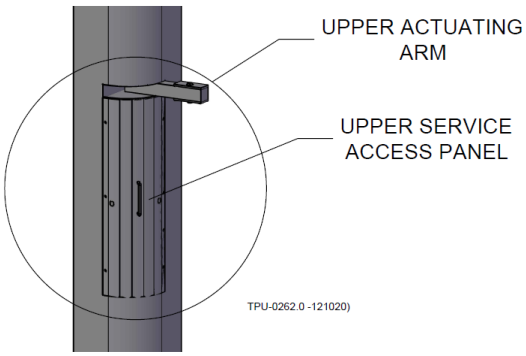


Fig B.11.2.b Remove Control cabinet Cover to access APEX II module.

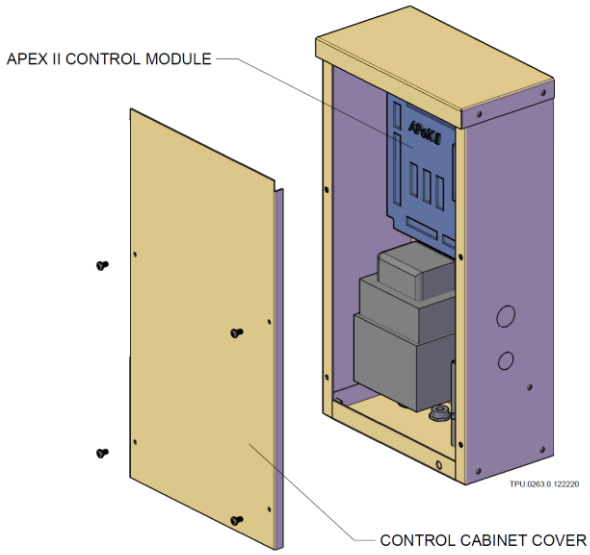
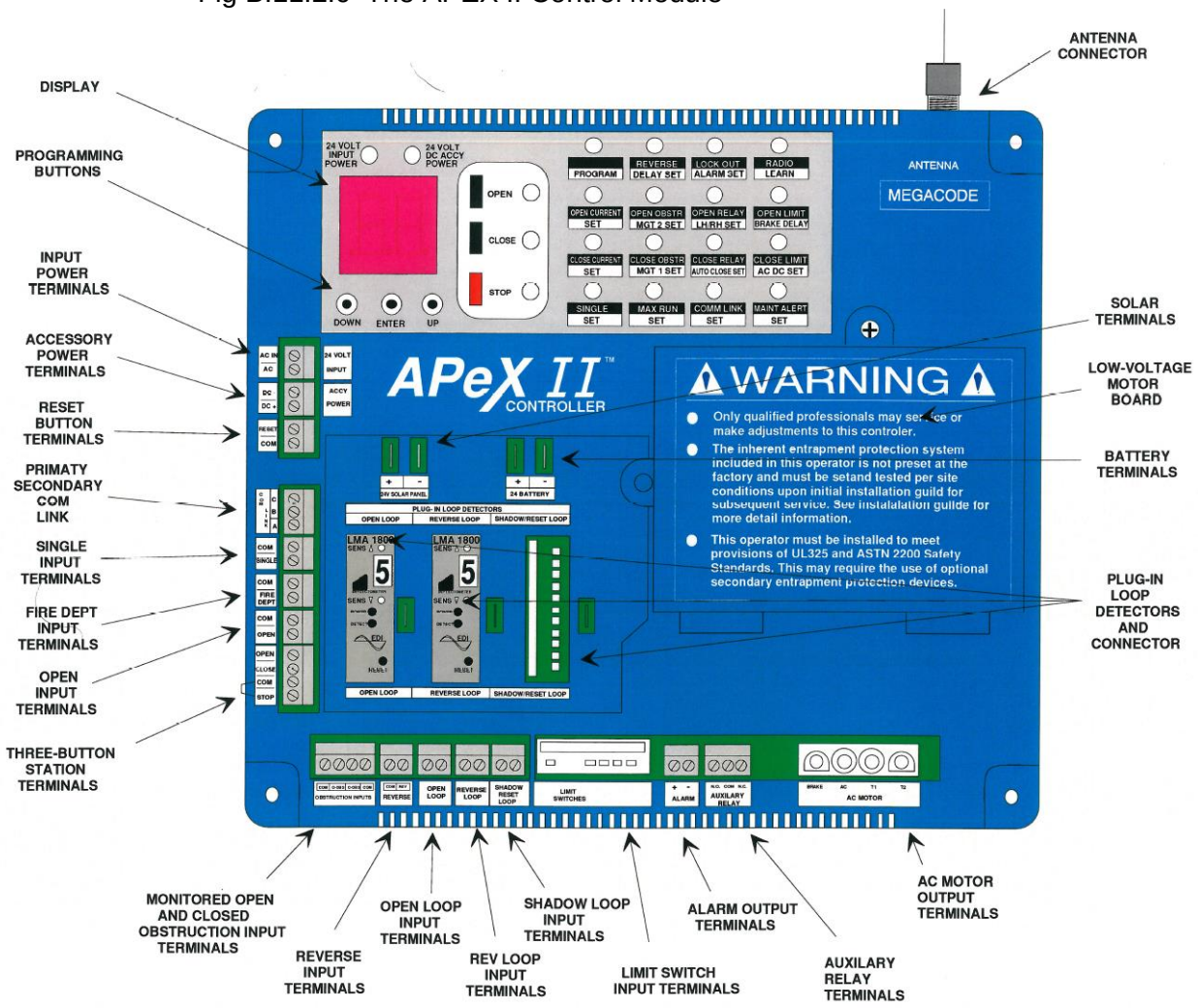


Fig B.11.2.c The APEX II Control Module



Note: APEX II Programmable Functions and Features

- Left- or right-hand operation.
- Dual gates enable.
- Auto close timer
- Run the alarm and pre-start alarm.
- Maximum open and direction setting
- Maximum close direction setting

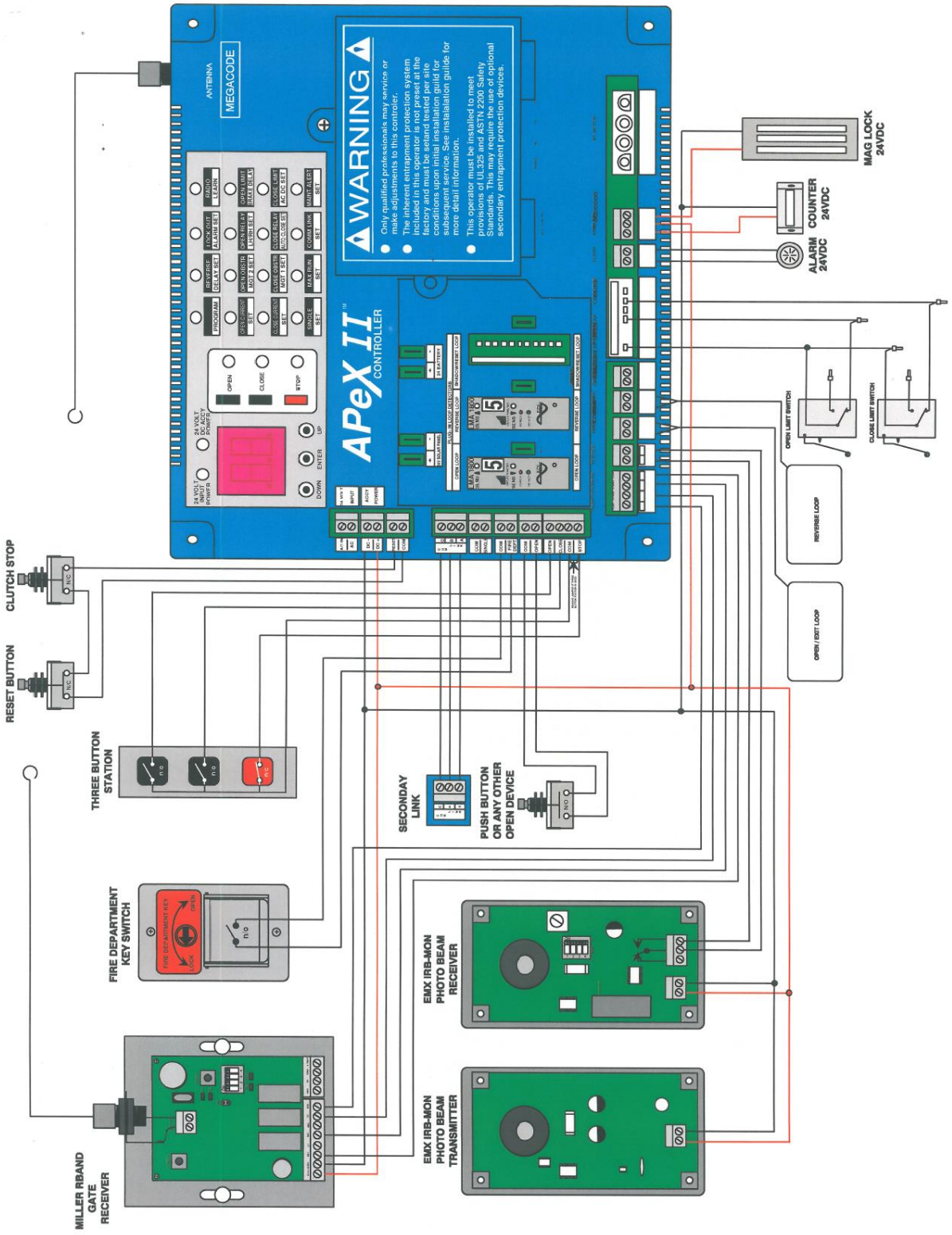
B.11.3 Follow next steps to initiate and proceed with basic programming:

1. Press and hold the UP and DOWN buttons together for one second to Enter the programming mode.
2. The programming indicator lamp on the module will light.
3. Proceed programming by following the keystrokes steps shown in the APEX II programming guide; Refer to **APPENDIX V: APEX II Programming Guide**
4. Press and hold the UP and DOWN buttons together for one second to Exit programming mode at any time.
5. The Controller will automatically exit programming mode after three minutes of inactivity.

Note: Contact your TORXUN trained installer for questions on programming the APEX II module and other questions about the Model 3 operator functions

B.11.4 Components controlled by the APEX II Controller

Fig B.11.4 Typical accessories to the Model 3 Swing Gate System controlled by the APEX II module



B.12 OPERATIONAL TEST

Following the completion of installation of the Model 3 operator-gate system and access and safety controls, operational tests must be conducted to ensure that the system works as expected.

The installer must conduct the following operational tests.

B.12.1 Test Stationary Access Control and Remote Access Control

1. Gate Open
2. Gate Close

B.12.2 Loop Control: Open Gate, Reverse Open and Gate normal timeout to close

1. Drive vehicle through entry
2. Drive vehicle through exit
3. Repeat drive-through test with different size vehicle(s) for loop response.

B.12.3 Photoeye and Edge Sensor Test for Obstruction and Entrapment

1. Walk through photo beams.
2. Confirm each photoeye activation and proper gate response.
3. Press each contact edge device.
4. Confirm edge device activation and proper gate response.
5. Confirm edge device transmitter/receiver consistent communication.

B.12.4 Test and Confirm Open Devices

1. Radio transmitter
2. Phone entry
3. Key switches
4. Exit loop.

B.12.5 Confirm Receiver Strength and Range

1. Confirm 25’ minimum range.
2. Adjust for minimum range.

B.12.6 Test Reverse Sensitivity

1. Hold the gate as it opens or closes.
2. Confirm the gate can be stopped.
3. Adjust reverse sensitivity/ motor current setting. (Factory setting at 9, may need to be more given gate size and ambient conditions)
4. Confirm the alarm sounds after two consecutive obstructions.

B.13 COMMISSIONING AND TURNOVER TO END-USER

B.13.1 Final Operator Commissioning

The Model 3 is factory tested before delivery to site. Adjustments may become necessary after arrival and installation on site. The following is the step guide to commissioning the operator-gate system.

1. Power up the gate system

2. Check open position.
   2.a Operate to open swing gate.
   2.b Check to see if the swing gate opens to the desired position.
   2.c If needed, locate the limit cams above control cabinet unit to adjust; Fig B.13.1.a
   2.d Loosen screw to rotate cam for open position of gate panel.
   2.e Retighten the cam screws.

3. Check close position.
   3.a Operate to close swing gate.
   3.b Check to see if the swing gate closes to the desired position.
   3.c If needed, locate the stop bolt beside upper swivel arm to adjust; Fig B.13.1.b
   3.d Loosen locking nut.
   3.e Adjust the stop bolt accordingly to the desired close position.
   3.f Set locking nut to secure.

4. Repeat the above steps if needed.

Fig B.13.1.a Limit Cam (switches)

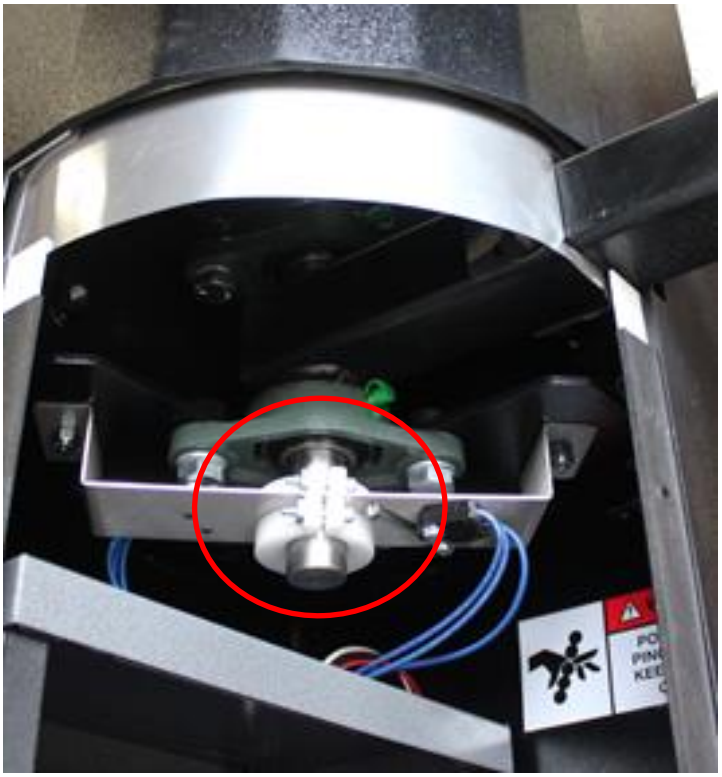
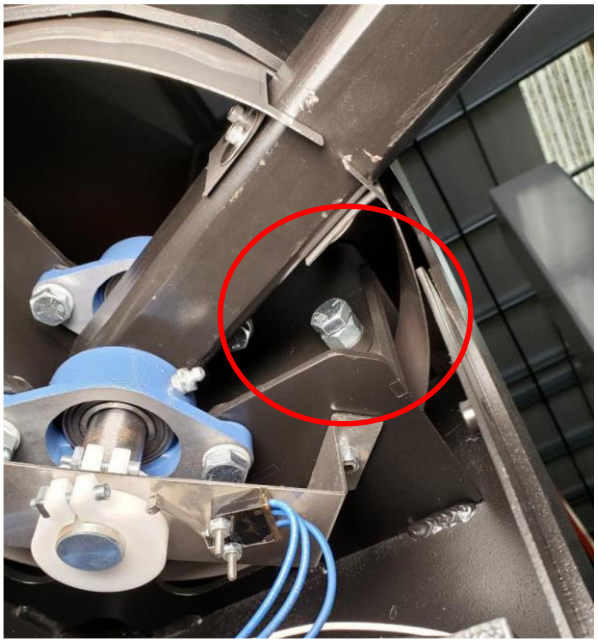


Fig B.13.1.b Stop Bolt



B.13.2 Check Weld Joint Conditions on the Following Items

B.13.2.a. Gate with FlexArm folding mechanism

1. U brackets
2. FlexARM mechanism
3. Extension rod into shafts
4. Gate frame joints

B.13.2.b. Gate with FlexGuide folding mechanism

1. U brackets
2. FlexGUIDE mechanism
3. Header and track welds
4. Gate frame joints

B.13.2.c. Single Gate Panels

1. U brackets
2. Gate frame joints

Note: Steel brush and apply touch-up paint on areas and weld-joints that have been repaired

B.13.3 Check Placement of UL Placards on Gate Panels

- Permanently place UL placards on each side of the gate for visibility of pedestrians approaching the gate from either direction.

B.13.4 Check Wiring Safety

1. Power off the system
2. Tug on all wire connections at terminals; tighten loose connections.
3. Tidy up wire routings and placements.

B.13.5 Install operator covers

B.13.6 Complete the commissioning checklist in Fig B.13.6.a

B.13.7 Handoff the Operator-Gate System to the End-user

Note: Send Product Registration to:
TORXUN Vehicle Access Technologies™
50 Sloan Court
Tracy, CA 95304
Fax: 888-492-4283
Email: sales@TORXUN.com

1. Hand keys and manuals to customer
2. Service, parts requirements and repairs; refer to Section C: User's Guide
3. Demonstrate the entrapment zone detection and activation devices.
4. End-user regular maintenance responsibility; refer to Section C: User's Guide

Fig B.13.6.a Commissioning and Turnover Checklist to End-User

Installer: Place check mark (√) in each item box as completed
Show completed checklist to owner/user:

- ☐ Confirm the gate operator being installed is appropriate for the application.
- ☐ Confirm the gate is designed and built according to current published industry standards and local codes.
- ☐ Confirm all appropriate features and accessory devices are being incorporated in accordance with current UL325 standards.
- ☐ Install a proper electrical ground to the gate operator, per local code
- ☐ Install all controls at least six (6) feet from the moving gate and operator; the ONLY exception is an emergency vehicle access device.
- ☐ Install controls where the user has full view of gate operation.
- ☐ Permanently install all warning signs (in accordance with current UL 325 standards) on both sides of the gate to warn persons in potential hazards associated with automatic vehicular gate operation.
- ☐ Test all features for proper functions before placing the automatic vehicular gate into service.
- ☐ Demonstrate the gate system to the end user the basic operation, safety features, how to turn off power and how to operate the manual disconnect feature.
- ☐ Leave safety instructions, product literature, installation manual and maintenance manual with the end user.
- ☐ Explain to the owners the importance of a service contract that includes a routine re-testing of the entire system including the entrapment protection devices.
- ☐ Offer the end user a maintenance contract, or contact them regularly to offer routine, proactive maintenance.

SECTION C

QUICKFOLD SYSTEM USER'S GUIDE

- C.1 Important Information for Model 3 Operator Users
- C.2 User Control
- C.3 Obstruction Detection Devices
- C.4 User Maintenance Information
- C.5 Parts Ordering
- C.6 Limited Warranty

C.1 IMPORTANT INFORMATION FOR MODEL 3 OPERATOR USERS

C.1.1 Awareness to Hazards on Automated Gate Systems

Vehicular gate systems provide convenience to their users and help control vehicular traffic onto a property. These systems produce high levels of force. Therefore, it is important that you are aware of possible hazards associated with this gate operating system. These hazards may include pinch points or entrapment zones.

Be sure that the installer of your system has:

- Instructed you on the proper operation of the gate and gate operator system.
- Fully trained you on the basic functions of the MODEL 3 Swing Gate System™ reversing systems and how to test them.
- Do not allow children to play in the area of the operator or to play with gate operating devices.
- This User's Manual is your property. Keep it in a safe place for future reference.
- If you choose to activate the gate close timer, loops and loop detectors must be installed and operational to prevent the gate from closing on vehicles.
- The speed limit for vehicular traffic through the gate area is 5 MPH. Install speed bumps and signs to keep vehicular traffic from speeding through the gate area. Speeding can result in damage to the gate, gate operator and vehicle.
- Be sure that all warning signs are permanently installed on both sides of the gate in an area where they are fully visible to traffic.
- It is your responsibility to periodically check all reversing devices. If any of these devices are observed to function improperly, remove the operator from service immediately and contact your installing or servicing dealer.

C.2 USER CONTROL

C.2.1 Vehicle Gate Access Controls

Your gate system is provided with one or a combination of several device(s) to operate the Model 3 operator to open and close the vehicle gate (e.g., exit ground loops, transmitters, handsfree tags, phone entry systems, etc.) . Contact your installer if you need instructions or further explanations on the functions and features of your access control system(s).

C.2.2 Alarm Reset-Button in the Model 3 Operator

When the Model 3 gate travel is stopped by an obstruction the gate will reverse back open. When it is stopped a second consecutive time, the gate will reverse away from the obstruction, stop and the alarm will sound. To shut off the alarm, press the reset-button mounted on the outside of the Model 3 cabinet (see Fig C2.2). Before giving the gate an open command, investigate and resolve the obstruction. If the obstruction is not obvious, call your TORXUN trained service technician for appropriate troubleshooting..

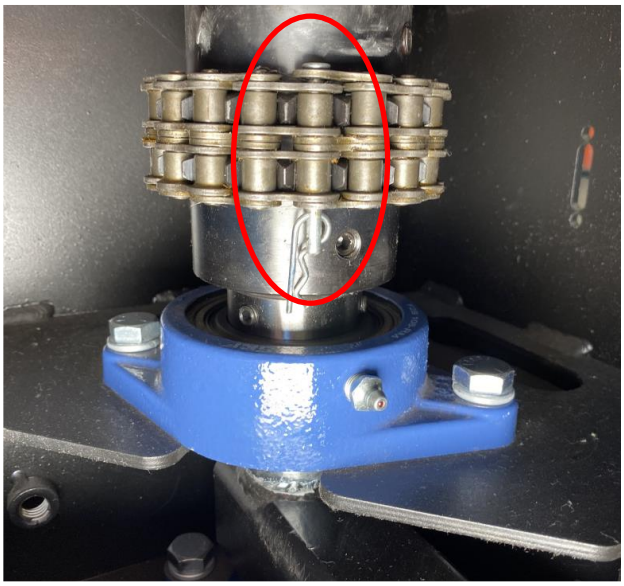
Fig C.2.2

C.2.3 Emergency Release of gate panel(s) from the Model 3 operator's actuating arm

In the event the gate must be moved without power use the manual release mechanism. The Model 3 operator has two design options for manual release. The standard variant is a chain and sprocket link between gear drive and arm; Fig C.2.3.a; the option is a direct clutch link between the gear-drive output shaft and the actuating arm; Fig C.2.3.b. IMPORTANT -- before releasing the gate manually, turn off AC and DC power.

Fig C.2.3.a Standard Chain and Sprocket Release (encircled)

The standard Model 3 operator has a chain and sprocket mechanically linking the gear-drive to the swing arm.



In the event that the gate operator gets stuck, and the gate panel is not able to move either to swing open or close, by disconnecting the chain link, the gate can be moved freely from the operator.

Note: Turn off the 120VAC power before attempting to work on the operator

To disconnect, pull free the cotter pin at the bottom of the lock pin using a pair of long-nose pliers. Pull out the lock pin from the top to release the chain link. Unwrap the double chain and set it aside. This action releases the actuating arm to rotate freely allowing the gate panel to move by hand.
To reengage the operator arm, wrap the double chain back onto the sprocket. Insert the

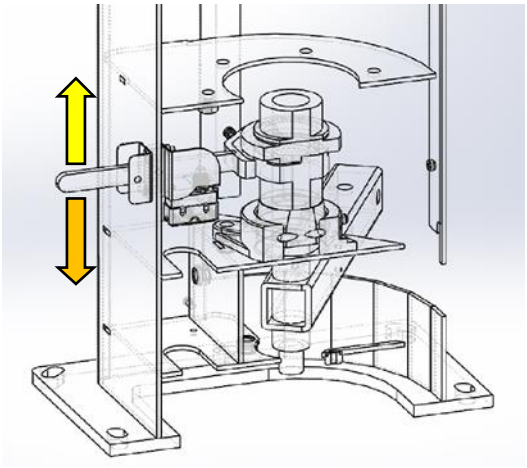
Lock pin from the top to reconnect the double chain. Insert the cotter pin back at the bottom of the lock pin. Ensure that the chain are properly seated on the sprocket.

Fig C.2.3.b (Optional) Clutch Release Lever

The manual clutch-release lever is an optional feature on the Model 3 Operator found near the base of the operator tower. Pulling up the lever disengages the mechanical swing (actuating) arm of the Model 3 operator from the motor gear-drive allowing the arm and the gate to pivot freely; the gate panels can be manually moved to swing open or close.

Pull-up to manually disengage the swing arm

Push-down to reengage the swing arm for normal operation



The operator arm can be reengaged by pushing down on the lever to return the system to normal operating condition.

C.3 OBSTRUCTION DETECTION DEVICES

Your Model 3 operator-gate system will be equipped with one or a host of gate control systems that protect pedestrians and vehicles as obstructions to swing gate actions and/or in entrapment zones between the moving gate and a solid object (e.g., wall, post, etc.). Commonly used detection devices are vehicle ground loops systems, photoeyes and edge sensors.

C.3.1 Photoeye - protection for people and objects

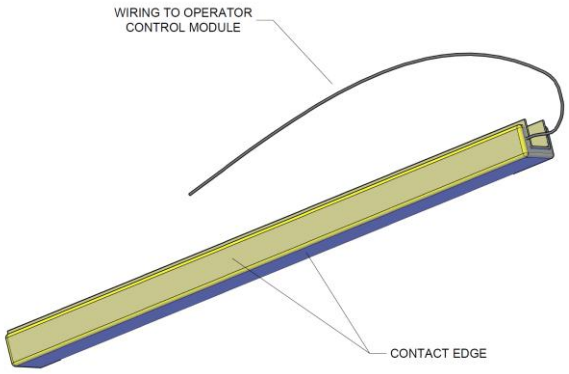
A sensor device that continuously shoots off an infrared beam across the gate opening to a corresponding receiving unit at the other end. There are two types of signal receiving units – a receiver sensor or a reflective mirror. When an obstructing object such as a person, a vehicle or any solid object is caught along the path of the infrared beam, the beam signal is cut. The event is translated by the photoeye as an obstruction which reverses or holds the gate preventing entrapment.

The gate action is resumed when the obstruction clears out and the infrared beam is reestablished across the photoeye units.

Note: Minimum distance of placement of photoeye units is 4”~6” away from face of operator tower

C.3.2 Edge Sensors – protection for people and objects

Edge sensors are soft safety devices that operate when touched using pressure sensors. If an obstacle touches the contact edges, the device signals the gate operator to stop and/or reverse the gate action preventing entrapment. Safety edges can be placed on fixed surfaces such as posts or on the leading edges or bottom frame of a swing gate; see Fig B.5.1.b for image of a typical placement.



C.3.3 Vehicle Detection Loops – protection for metallic objects only, does not protect people/pedestrians

Coils of jacketed wire in a closed-circuit loop (ground loop) embedded in the vehicle drive path that detects the presence of a metallic object such as a passing or stationery vehicle. A wire harness connected to the ground loop runs in the ground in a conduit leading up to a

detector module in the gate operator. Working in tandem, the ground loop and the detector unit send signals to the Model 3 APEX control board which opens, stops or reverses the gate as designed to avoid obstructions and/or reactivates the gate action when obstruction has cleared.

C.4 USER MAINTENANCE INFORMATION

C.4.1 End-User Gate Maintenance Responsibility

A maintenance and service program should be in place for the continued upkeep of your automated gate system. Gate servicing should be scheduled regularly to ensure safe operation, minimize issues and extend the life of the Model 3 gate system.

C.4.2 Model 3 Operator regular maintenance requirement

The TORXUN MODEL 3 recommended maintenance schedule varies according to the frequency of use of the operators, whether lightly used operators (once or twice an hour) or heavily used operators (many cycles per hour).

Maintenance by End-User:

At least every six months perform the following checks on the Model 3:

- Before operating the system, perform a visual inspection of the gate area and on both sides of the gate.
- Observe the gate open and close several cycles; note any anomalies.
- Verify all installed reversing devices work properly.
- Replace Reversing Edge transmitter batteries (refer to manufacturer's manual).
- Open Model 3 operator and controller cabinet. Check for evidence of water, insects and/or rodents. Clean as necessary.
- Grease (4) four pivot arm bearings, do not overfill, grease should not come out of the bearing, (overfilling may blow the seal)
- Check the condition of upper and lower debris rings. If damaged, straighten or replace.
- Routinely confirm the display and excellent condition of warning signs on both sides of the gate.
- Check the voltage in the two 12V batteries. Confirm each is holding at 12V. If a battery falls below 12V it should be replaced.

C.4.3 For operator-gate system with TORXUN FlexGUIDE folding mechanism

Maintenance by End-User: Refer to **Appendix II: FlexGuide** (comes with the FlexGuide Kit)

- Check the condition of the track wheels for uneven wear and proper height in the track. Adjust as necessary. (Note: sagging of the gate panel requires adjustment of the wheel height)
- Grease the folding gate TORXUN HeavyHinge by pumping grease through the Zerk[4] fittings until grease comes out of the bronze washers.
- Wipe off excess grease.

[4] Zerk fitting – lubrication valve fitting

C.4.4 For operator-gate system equipped with the TORXUN FlexARM folding mechanism

Maintenance by End-User: Refer to **Appendix III: FlexArm** (comes with the FlexArm Kit)

- Grease the Zerk[2] fittings on the FlexARM assembly.
- Grease the folding gate TORXUN HeavyHinge by pumping grease through the Zerk[2] fittings until grease comes out of the bronze washers.
- Wipe off excess grease.

C.4.5 Obstruction Controls

- Check all reversing devices.

C.4.6 The Control Panel

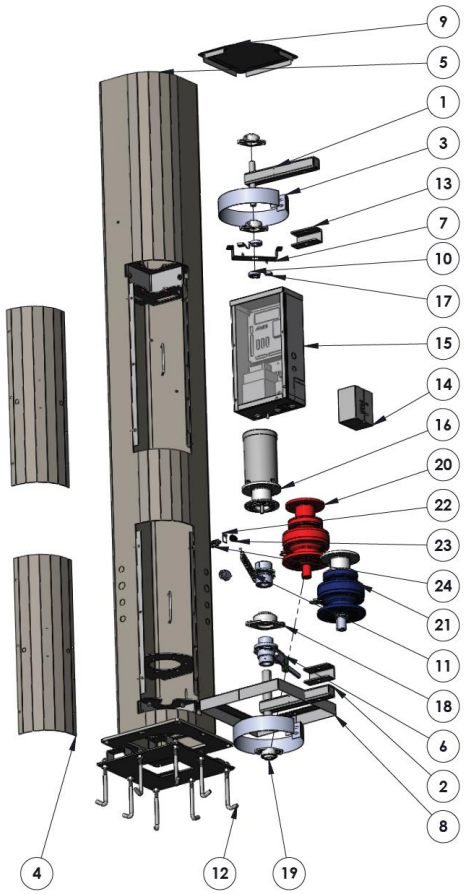
- The control panel requires no maintenance.

C.4.7 TORXUN Repair Assistance

- Contact your installer for questions on maintenance and repair of your gate system. (An untrained, unqualified end user should never attempt to repair the gate system.)
- Retain this Handbook (TORXUN Model 3 Swing Gate System) for installation, maintenance, and safety instruction reference.

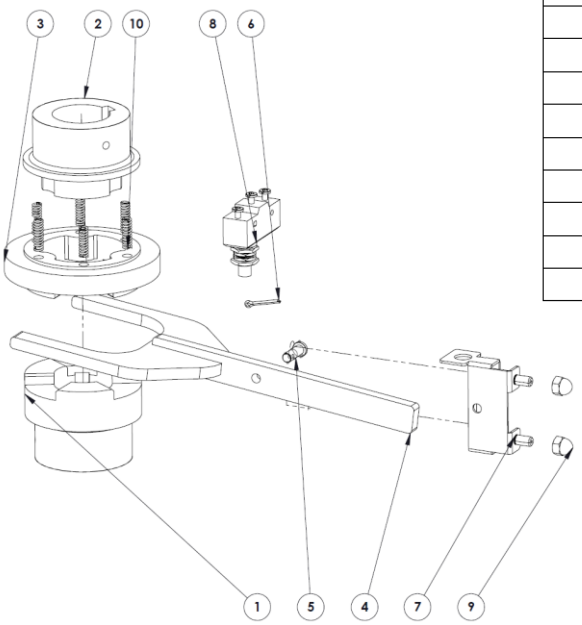
C.5 PARTS ORDERING

C.5.1 Tower Parts



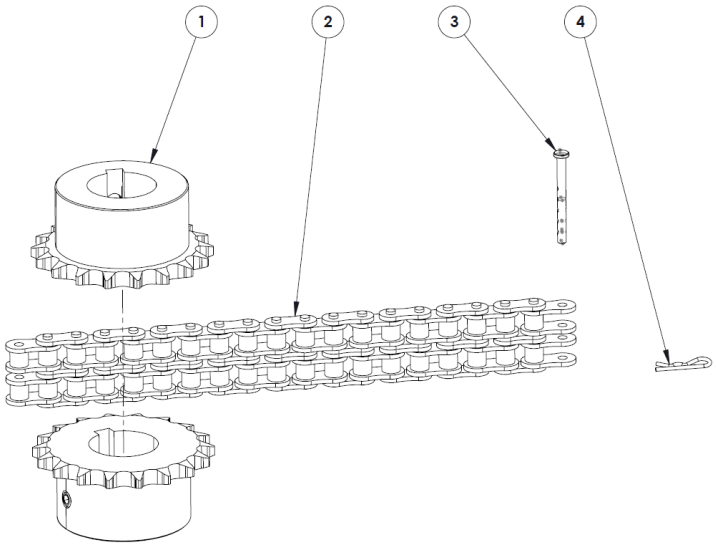
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9950-0153	UPPER ARM	1
2	9950-0150 REV A	LOWER ARM	1
3	9950-0005-	DEBRIS RING	2
4	9950-0004-REV-A	MODEL 3 ACCESS PANEL	2
5	9950-0002-REV-A	WELDMENT WITH LIDS	1
6	9922-0001	FAST MANUAL RELEASE	1
7	9917-004X	SWITCH BRACKET	1
8	9917-002X	VANITY BASE COVER-OPTIONAL	1
9	9917-0001	TOWER TOP CAP-OPTIONAL	1
10	9906-0017	SWITCH CAM	2
11	9906-0009	MANUAL RELEASE	1
12	9904-005R	ALIGMENT JIB-OPTIONAL	1
13	9902-008R	QUICK FOLD U-BRACKET	2
14	9800-0052	DURACELL 12V BAT	1
15	1114-0010	CONTROL CABINET	1
16	108.050	LEESON MOTORS	1
17	0E72-40KT	CHERRY SWITCH	2
18	02087242	MOTION IND 1.5DIA 2 BOLT FLANGE	1
19	02087235	MOTION IND 1' FLANGE BEARING	3
20	GXLED8115B-1	STANDARD GEARBOX	1
21	AGPSDTGB	FAST GEARBOX-OPTIONAL	1
22	ZBY 2322	RESET PLATE	1
23	zb5aa2	pushbutton head Ø22	1
24	ZB5AZ102	RELAY & BASE	1
25	BRP4535S-24-C	ICC- INTERVOX	1

C.5.2 Clutch Release Parts



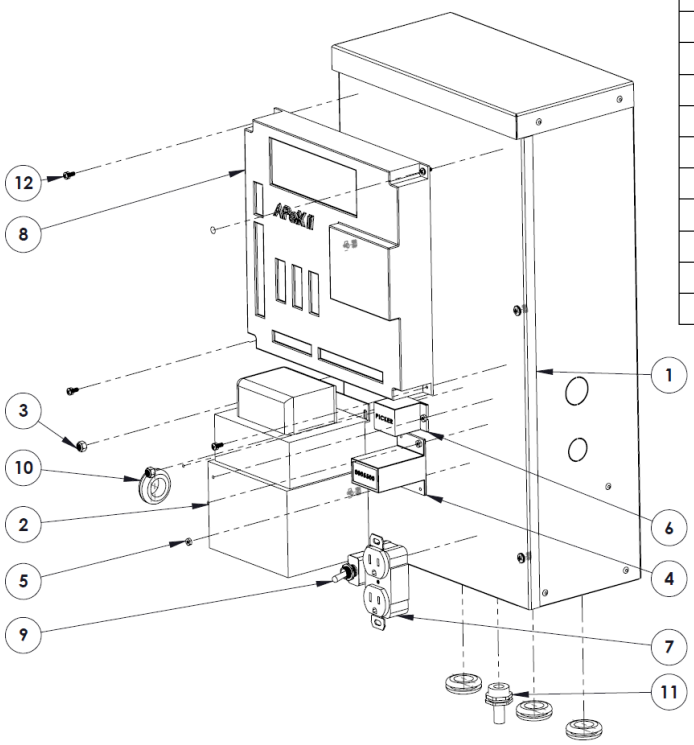
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9922-0002	DOG CLUTCH SIDE ONE	1
2	9922-0003	DOG CLUTCH SIDE TWO	1
3	9922-0004	DOG CLUTCH SLIDING COUPLING	1
4	9922-0005	DOG CLUTCH HANDLE WLDM	1
5	97245A135	1/4DIAx3/4LG CLEVIS PIN	1
6	98355A070	SS COTTER PIN	1
7	9922-0011	M3 MANUAL RELEASE BRKT	1
8	7090K390	SNAP-ACTING SWITCH	1
9	90507A230	1/4-20 CAP LOCKNUT	2
10	9435K48	SS COMPRESSION SPRING	6

C.5.3 Chain and Sprocket Drive Parts



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SB5018-L-T1H	EMC ROLLER CHAIN SPROCKET	2
2	50-2R	FUH INDUSTRIAL CHAIN	1
3	98330A120	3/16DIAx2"LG ADJ CLEVIS PIN	1
4	98335A060	5/64x1-1/4LG HAIRPIN	1

C.5.4 Control cabinet Parts



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9950-0011 REV B	CONTROL CABINET ASSEMBLY	1
2	35-M020	DONGAN TRANSFORMER	1
3	90631A009	8-32 LOCKNUT	2
4	RV8-4916	CYCLE COUNTER	1
5	34-7000	4-40 HEX NUT	4
6	1C-245-T5-X	PICKER RELAY	1
7	BR15-1	LEVITON RECEPTACLE	1
8	620-101293	APEX 2 CONTROL BOARD	1
9	70131538	CARLING TOGGLE SWITCH	1
10	9307K82	3/4"ID FOR 1-1/16 HOLE GROMMET	4
11	49009	CORD GRIP	1
12	42-6604	#6-32x1/2LG SCREW	4

C.6 LIMITED WARRANTY

To the original purchaser only: TORXUN Vehicle Access Technologies, (hereafter referred to as TORXUN) warrants, for five (5) years from the date of invoice, the gate operator systems and other related systems and equipment manufactured by, and distributed by TORXUN, to be free from defects in material and workmanship under normal use and service for which it was intended provided it has been properly installed and operated. TORXUN's obligations under this warranty shall be limited to the repair or exchange of any part or parts manufactured by and distributed by TORXUN. Defective products must be returned to TORXUN, freight prepaid by purchaser, within the warranty period. Items returned will be repaired or replaced, at TORXUN's option, upon an examination of the product by TORXUN, which discloses, to the satisfaction of TORXUN, that the item is defective. TORXUN will return the warranted item freight prepaid. The products manufactured by TORXUN and distributed by TORXUN are not warranted to meet the specific requirements, if any, of safety codes of any state, municipality, or other jurisdiction, and TORXUN does not assume any risk or liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

Any products and parts not manufactured by TORXUN and distributed by TORXUN will carry only the warranty, if any, of the manufacturer. This warranty shall not apply to any products or parts thereof which have been repaired or altered, without TORXUN's written consent, outside of TORXUN's workshop, or altered in any way so as, in the judgment of TORXUN, to affect adversely the stability or reliability of the product(s) or has been subject to misuse, negligence or accident, or has not been operated in accordance with TORXUN's instructions or has been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such product(s). TORXUN shall not be liable for any loss or damage whatsoever resulting, directly or indirectly, from the use or loss of use of the product(s). Without limiting the foregoing, this exclusion from liability embraces a purchaser's expenses for downtime or for making up downtime, damages for which the purchaser may be liable to other persons, damages to property, and injury to or death of any persons. TORXUN neither assumes nor authorizes any person to assume for them any other liability in connection with the sale or use of the products of TORXUN. The warranty herein- above set forth shall not be deemed to cover maintenance parts, including, but not limited to, hydraulic oil, filters, batteries, or the like. No agreement to replace or repair shall constitute an admission by TORXUN of any legal responsibility to effect such replacement, to make such repair, or otherwise. This limited warranty extends only to wholesale customers who buy directly through TORXUN's normal distribution channels. TORXUN does not warrant its products to end consumers. Consumers must inquire from their selling dealer as to the nature and extent of that dealer's warranty, if any.

This warranty is expressly in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for use. This warranty shall not apply to products or any part thereof which have been subject to accident, negligence, alteration, abuse, or misuse or if damage was due to improper installation or use of improper power source, or if dam- age was caused by fire, flood, lightning, electrical power surge, explosion, wind storm, hail, aircraft or vehicles, vandalism, riot, or civil commotion, or acts of God.

SECTION D

TROUBLESHOOTING

D. TROUBLESHOOTING GUIDE

NOTE: In most cases the APEX II control board will help you diagnose any issues with the operation of the Model 3 gate system. The control board's signal lights and display when referenced with APPENDIX V - APEX II programming manual will often direct you to the cause.

	Issue	Likely cause(s) -- In general order of probability	Solution
1	The operator won't open or close the gate	Stop circuit is open - won't allow gate to run	Press the stop button on the APEX II control board to reset. Then confirm normal operation by pressing the open or close button.
		Obstruction/Entrapment Protection sensor device is not equipped with a 10k resistor. This is possible only at the time of initial installation or adding a new device.	Monitored entrapment protection devices must include a 10k resistor. Replace with appropriate 10k device.
		No AC power and DC dead or disconnected	Check incoming AC power - restore. Check 12V batteries for charge -- recharge with AC power or replace.
		Bad low voltage motor board	Replace low voltage motor board. PN 2500-2399
		Bad transformer	Replace transformer. PN cat#35-mo20
2	Gate won't open - no AC power	Without AC power, the Model 3 operator will use batteries to operate. If AC power is off for a long time, eventually, the batteries will run out of voltage and will not be able to operate the Model 3.	
		12V 7ah Batteries running low/ dead	Reconnect AC power. This will recharge the two 12V batteries. After they are fully charged, check the voltage of <u>each</u> separately to confirm 12V. Eventually the batteries will need to be replaced when they do not have a 12V charge.

3	Gate won't open - AC power okay	The opening device is not working • battery • settings	To isolate a malfunctioning activation device problem: a. check another open device; If the other device works, troubleshoot the malfunctioning devices. Programming of the device, batteries or wiring issues are three possible causes. b. If other devices are also not working, push the "Open" button on the APEX II control board Contact your TORXUN trained service technician to support further troubleshooting.
4	Gate panels don't align when closed	Limit switches misadjusted	Adjust the close limit switch on both operators, as necessary until gates align. Very touchy adjustment...tap limit dog (white plastic piece) with a small hammer
		Physical stop on close position misadjusted	Once limit switches are adjusted, tighten the close position physical stop bolt. Adjust bolts so when it comes against the top pivot the motor runs for an additional fraction of a second no longer.
5	Gate panels interfere with each other when closing (sometimes with yokes)	Observe the gates closing to determine the cause of the interference.	
		Leaf delay adjustment	If the gates must sequence their closing so that one is closed before the other to avoid interference -- adjust the leaf delay. See Appendix xx APEX II Control Board Programming.
		Yoke/ Maglock design	If a yoke or other assembly has been added to one or both gates, it may need to be removed or modified. Note: Any attachment

			to the gate must be designed to accommodate the movement of the gates which is distinct from either a traditional slide or swing gate.
6	Gate opens too far or not fully	Limit switches mis adjusted	Adjust the open limit switch in the operator, as necessary so gate stops for the correct open position.
7	The gate opens fully, times out, begins to close but stops and reverses back open.	The gate movement is triggering the inherent reverse sensor in the control board.	Inspect the gate and gate area for an obstruction that is interfering with the smooth, easy movement of the gate. Resolve the issue. If no issue is found, increase the close current sensor level while maintaining the safe operation of the system when the gate does encounter an obstruction.
		An obstruction is sensed by a photoeye or edge sensor reversing device.	Inspect the gate and gate area for an obstruction that is interfering with the reversing sensor device. Resolve the issue. Confirm the alignment of the photoeye. Adjust and secure as necessary.
8	The gate holds open too long before it starts to close or does not close	Close timer setting too long	Adjust the close timer on the APEX II board to a shorter hold open time.
		The gate movement is triggering the inherent reverse sensor in the control board.	Inspect the gate and gate area for an obstruction that is interfering with the smooth, easy movement of the gate. Resolve the issue. If no issue is found, increase the close current sensor level while maintaining the safe operation of the system when the gate does encounter an obstruction.
		An obstruction is sensed by a photoeye or edge sensor reversing device.	Inspect the gate and gate area for an obstruction that is interfering with the reversing sensor device. Resolve the issue. Confirm the alignment of the photoeye. Adjust and secure as necessary.

		Monitored edge sensor is not communicating with control board.	If a monitored entrapment protection reversing device is not functioning or communicating with the control board, the operator will hold the gate open. Possible causes: a. Battery is low/dead in a wireless sensing edge. Replace the battery. (Batteries should be changed at least every 12 months) b. Wireless communication between the edge transmitter and receiver is not consistent. Check and resolve connections, signal, antenna positioning.
9	Monitored edge sensor is not communicating with the control.	Battery is low/dead in a wireless sensing edge.	Replace the battery. (Batteries should be changed at least every 12 months)
		Wireless communication between the edge transmitter and receiver is not consistent.	Check and resolve connections, signal, antenna positioning. If local RF signals are heavy (typically from a site with heavy RF use: hospital, police station, airport, etc.) it may be necessary to hard wire the edge sensor to the APEX II control board using appropriate armored cable between the hinged gate leaves.
10	Excessive mechanical noise	Listen to the type of noise and try to locate it and its cause.	
		Gearbox grease low (noise from gearbox, low in the Model 3 cabinet)	Top up the grease in the gearbox. Open two grease fill points (¾" inch plugs) look inside. If not packed solid, add grease until full. (Recommended lubricant: engineers almaplex 1275)
		Bearing grease low in 3 pillow block bearings (noise in upper or lower cabinet)	Top up grease in pillow block bearing. See maintenance procedure (Section C.4.2). Do

			not overfill.
		Motor bearing failing and/or brush material and dust build up	Contact your TORXUN trained technician. Motor may need to be replaced.
11	Alarm is sounding	Gate is encountering an obstruction	Press the Reset button to stop the alarm. Follow the procedure in Section C.2.2. The alarm sounds after two repeated incidents of the gate pushing against an obstruction.
		Current sensing set too low	If no issue is found, increase the close current sensor level while maintaining the safe operation of the system when the gate does encounter an obstruction.
12	Master and secondary operators are working independently, erratically	In bi-parting installations the Master and Secondary Model 3 operators communicate with each other using a wired connection.	
		Board versions must match	Replace one of the APEX II boards so the version on each match.
		Master - Secondary wiring	Check the connections and condition of the wire running between the two operators.

SECTION E

APPENDIX

APPENDIX I

QUICKFOLD MODEL 3
MOUNTING, ALIGNMENT
AND
INSTALLATION GUIDE

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Email: sales@TORXUN.com
www.TORXUN.com

LISTED

Table of Contents Appendix I

[5] This section applies to the Model 3 operator with or without a swing gate attached to it

[6] Skip this Section if Model 3 operator includes gate unit attached to it

A. Pre-Installation On-Site Inspection

A.1 Check and Inspect Operator's Exterior

- Use sufficient rigging equipment and labor to stand the Model 3 on its base.
- Secure operator tower temporarily against toppling over
- Check for damage to the tower body.
- Check base plate condition.
- Check upper and lower operator swing arms (if gate is not included)
- Take photos and document damage found on the operator.
- Address damages with carrier as appropriate

A.2 Check inclusion of Installation Documents

- Check inclusion of the following manuals
  - Appendix II FlexGuide Installation Guide
  - Appendix III FlexArm Installation Guide
  - Appendix IV LockDock Installation Guide
  - Appendix V Apex II Programming Guide

A.3 Check and Inspect Swing Gate Unit (if included)

- Check attachment of gate to upper and lower actuating arms
- Visually inspect for bent frame, frame dents, scratched paint or coating, cracked weldment
- If the gate is bifold type, check installation of hinges between panels.

A.4 Check and Inspect Accessories (if included)

- Photoeyes
- Edge Sensors
- Vehicle Detection Loops

A.5 Review Installation Instructions and Safety Precautions

Before beginning the installation process, become familiar with the instructions, illustrations, safety precautions and wiring guidelines in this manual. This will help ensure that the installation is performed in an efficient, safe, and professional manner.

B. Assemble and Install the Mounting-Alignment Jig

B.1 What is in the box

Fig B.1.1 Alignment Jigs (1 pair per one-unit Model 3 Operator)

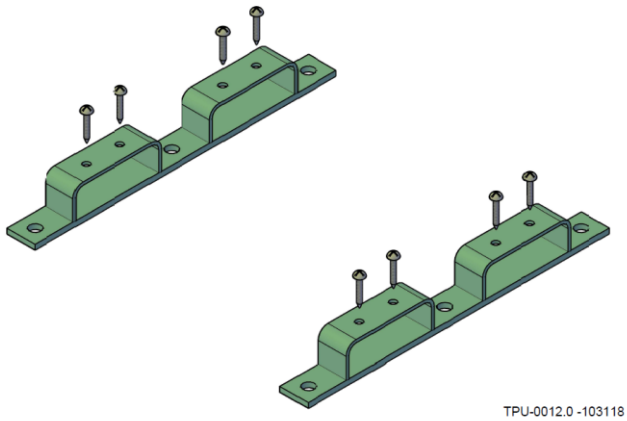


Fig B.1.2 Anchor-Bolt Plate (1 piece per one-unit Model 3 Operator)

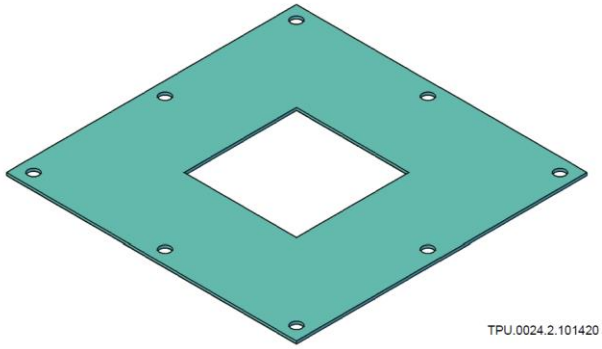
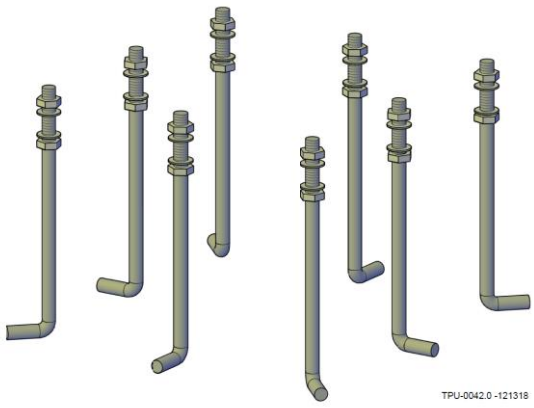


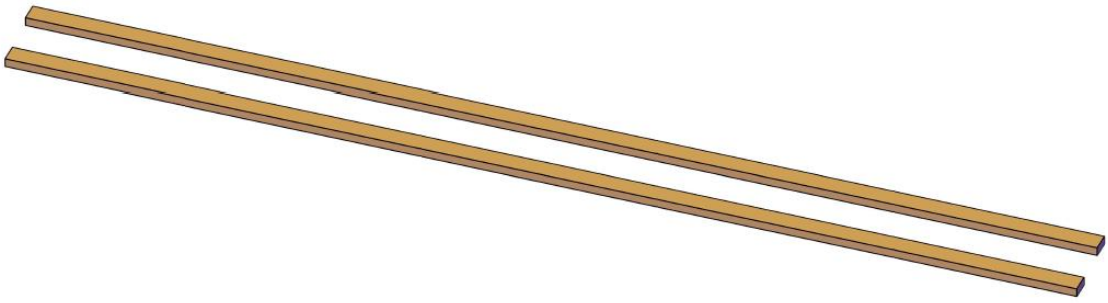
Fig B.1.3 Anchor Bolts with nuts & washers (set of 8 per one-unit Model 3 Operator)



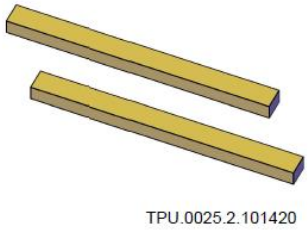
B.2 Customer Supplied Items (Not included in Torxun Kit “box items”)

Fig B.2.1 Wood Boards 2”x4”

- 2” x 4” Wood Boards: long boards to span across the foundation pit(s) needed for alignment procedures in conjunction with the Torxun Model 3 Operator Mounting and Alignment Kit; Customer to supply the quantity needed for the project



- 2” x 3” Wood Boards: two(2) short boards of about 3’ long each to use as spacer in mounting the alignment jig to the rebar cage



B.3 Assemble the Alignment Jigs

- On each anchor bolt, insure that lower bolt nuts are turned all the way to the bottom thread.
- Place corresponding washers on each of the lower bolt-nuts (8); Fig B.3.1
- Insert each anchor bolt to the anchor-bolt plate from the bottom of the plate; Fig B.3.1
- Slide the alignment jigs on the corresponding anchor bolts (2)
- Put washers on each anchor bolt followed by each corresponding nut (8)
- Tighten all upper nuts and washers to secure the alignment jigs to the anchor-bolt plate.
- Fully assembled mounting-alignment kit is shown in Fig B.3..2

Fig B.3.1 Attach each alignment jig to the anchor-bolt plate using anchor bolts (8)

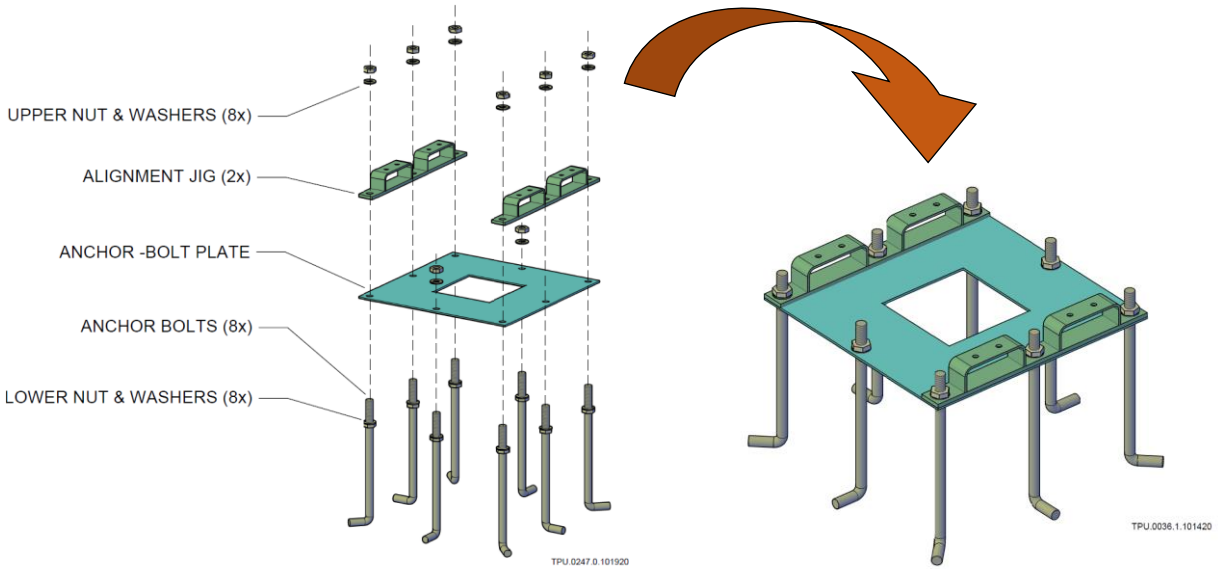


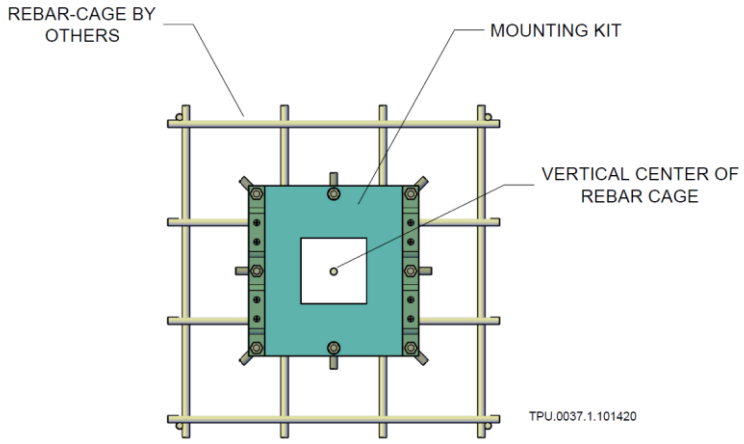
Fig B.3.2 Fully Assembled Mounting Kit

B.4 Install the Alignment jigs to the rebar-cage

Note: This step requires the rebar-cage(s) to be above ground outside of the pit; held steady to work on

- Place the mounting kit on the middle-top of the rebar-cage(s); Fig B.4.1
- Align the center of the mounting kit to the vertical center of the cage (concentric to cage)

Fig B.4.1 Plan View: Mounting-Alignment kit on top of rebar cage, centered and squared.



- Prop-up the mounting-alignment kit 2” above the rebar-cage using the 2x3 boards as spacers; Fig B.4.2; see inset image.
- The anchor bolts will extend into the rebar-cage.
- Check the horizontal level of the anchor-bolt plate (N,S,W,E) across the cage; shim and adjust accordingly; Fig B.4.3.
- Fasten the anchor bolts to the rebars securely with wire ties; TORXUN recommends.

welding the anchor bolts to the rebar cage with the aid of scrap rebars placed randomly to make physical contact or connections between anchor-bolts and cage to form strong weldments; Fig B.4.3.

- Remove the 2x3 boards spacers under the mounting kit after the anchor bolts are fastened securely.

Fig B.4.2 Side Elevation View: Mounting-Alignment kit on the rebar cage

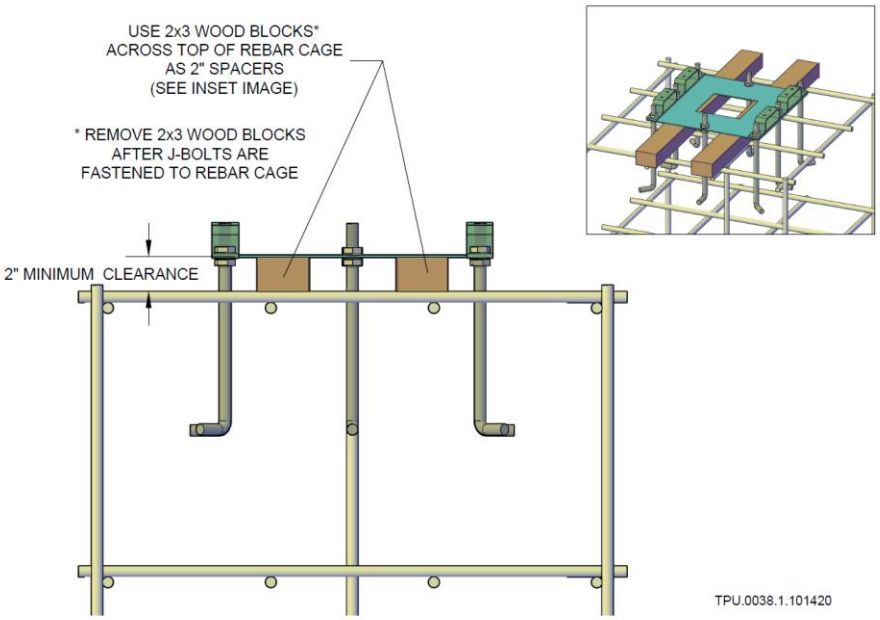
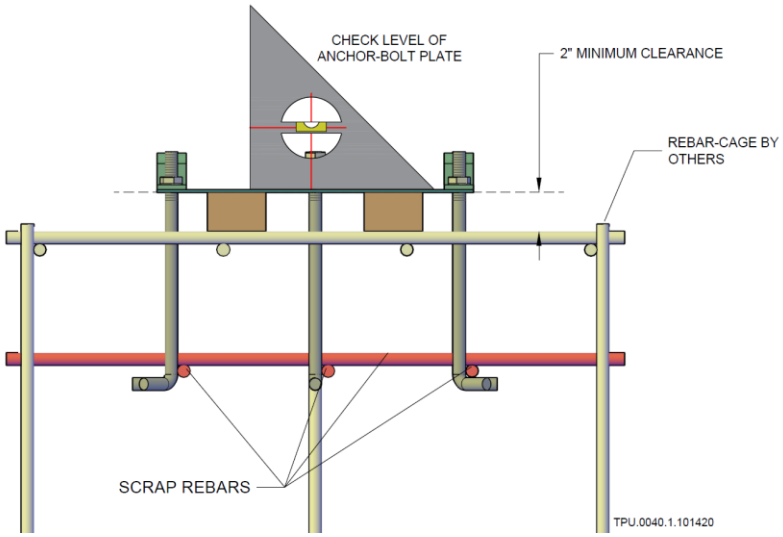


Fig B.4.3 Check level of the anchor bolt plate (N-S,W-E)



C. Building the Footing and Foundation

***** IMPORTANT NOTE TO CONTRACTORS, INSTALLERS AND END-USERS

TORXUN IS NOT RESPONSIBLE FOR FOUNDATION AND FOOTING DESIGN FOR GATE SYSTEMS AND DOES NOT ENGAGE IN THE DESIGN, CONSTRUCTION AND INSTALLATION OF FOUNDATION AND FOOTING FOR GATES AND OPERATOR EQUIPMENT

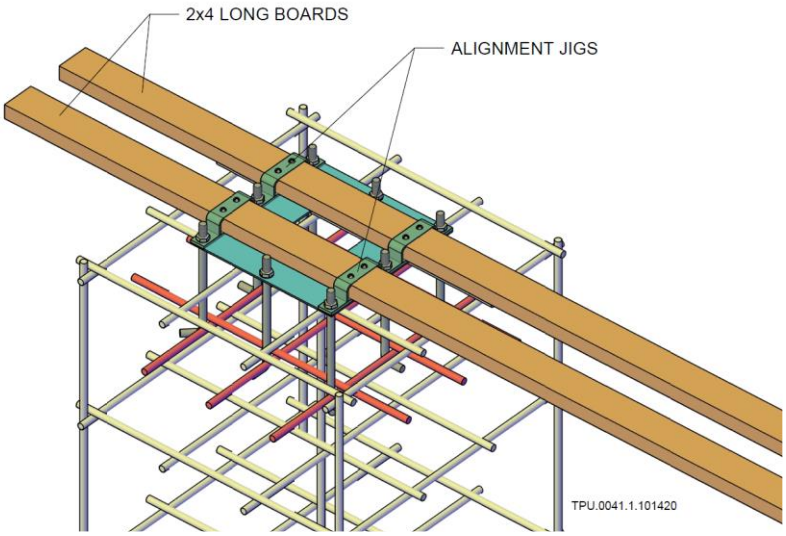
TORXUN RECOMMENDS CLIENT TO CONSULT A PROJECT ARCHITECT AND/OR A STRUCTURAL ENGINEER FOR THE APPROPRIATE FOUNDATION AND FOOTING DESIGN INCLUDING THE DESIGN AND SPECIFICATIONS OF REBAR-CAGE(S), ITS ANCHOR SYSTEM AS WELL AS DETERMINATION OF CORRECT CONCRETE FOOTING CONFIGURATION AND DIMENSIONS

THE FOLLOWING INSTALLATION INSTRUCTIONS ASSUME THAT THE FOUNDATION PIT, CORRESPONDING REBAR-CAGE(S), AND CONCRETE WOOD FORMS ARE PRE-CONSTRUCTED BY OTHERS, READY AND IN-PLACE AT THE SITE FOR EQUIPMENT INSTALLATION

C.1 Lower the Rebar Cage in Pit

- Ensure all eight (8) anchor-bolts are fastened rigidly in-place.
- Ensure the 2x3 wood boards (or other spacers) are removed under the mounting kit.
- Insert the customer supplied 2x4 wood boards to the alignment jigs; Fig C.1.1
- Fasten the wood boards with wood screws included in the kit.

Fig C.1.1 Rebar cage, mounting-alignment jig and 2x4 wood boards assembled in place.



- Grab the 2x4s at both ends to lift the entire assembly (jig and rebar cage) to lower into the pit.
- The long boards will sit flat across the top of the concrete wood form; Fig C.1.2
- The rebar-cage should be hanging in the pit held by the long boards; Fig C.1.3
- Move the assembly to align to the geometric vertical center of the pit, and
- Swivel the 2x4 boards to align and center along the gate line; Figs C.1.2
- Fig C.1.4 and Fig C.1.5 illustrate the same procedure for a single operator and a dual operator installation respectively.

Fig C.1.2 Plan View: Align 2x4 boards and rebar cage to gate line

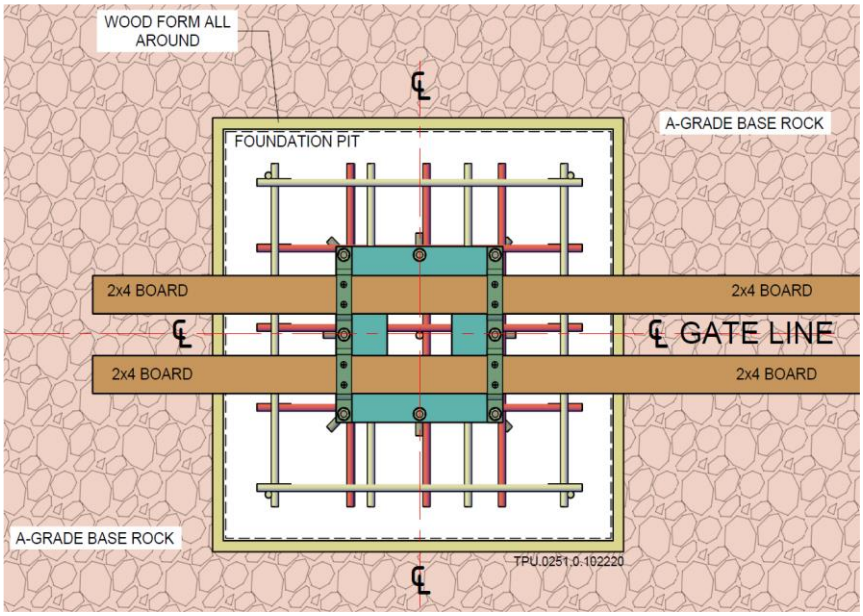


Fig C.1.3 Rebar cage on the wood form hanging in the pit

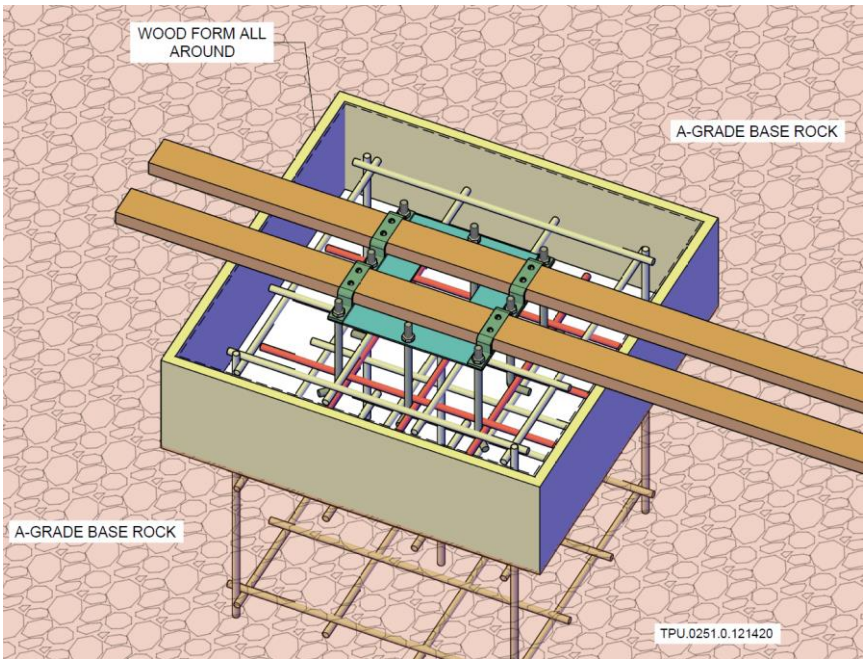


Fig C.1.4 Plan View: Alignment of a single operator installation

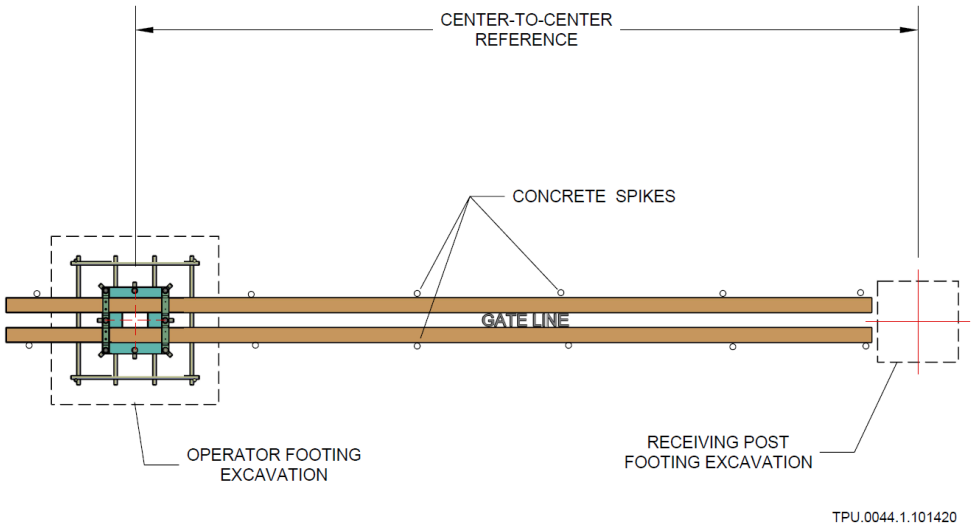
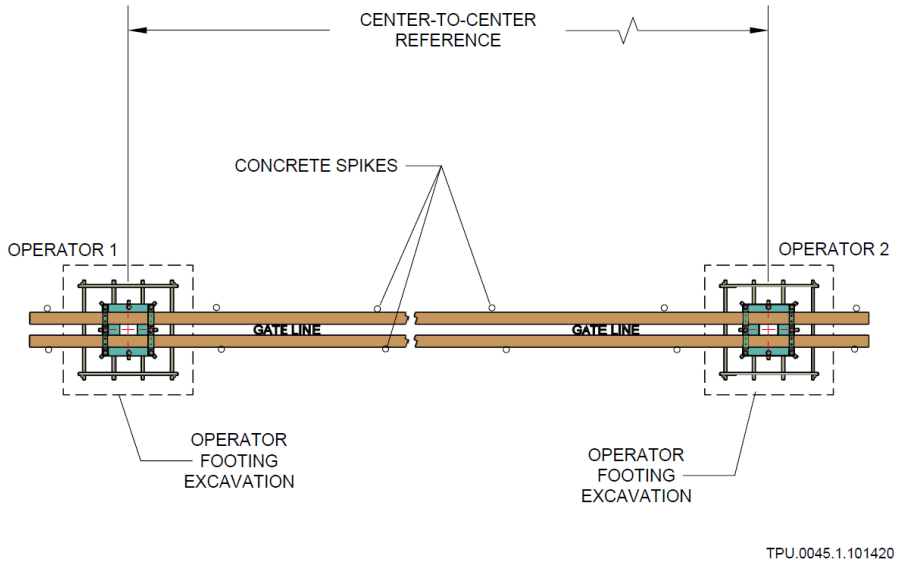


Fig C.1.5 Plan View: Alignment of a dual operator installation



- Guide the 2x4 long boards with concrete spikes to keep it aligned with the gate line; Fig C.1.6
- Support the rebar-cage at the bottom with dobie blocks to level-up as shown in Fig C.1.7
- Follow the same instructions above for the second operator if installing a two-operator system such as a biparting or double swing gate.

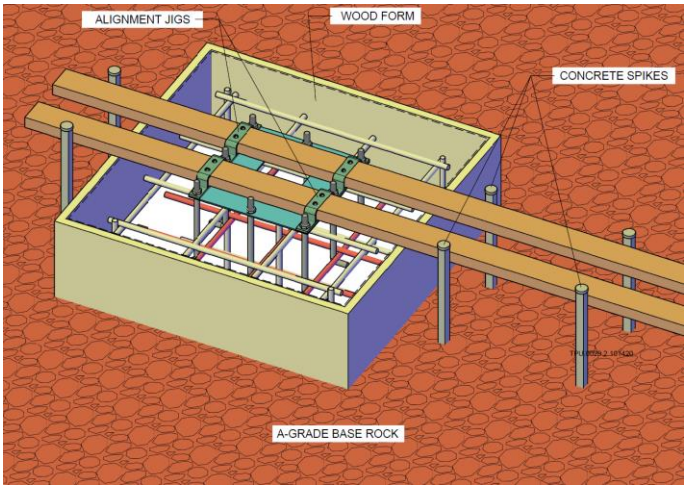


Fig C.1.6 Use concrete spikes to support the 2x4 boards in aligning with gate line.

Fig C.1.7 Elevation View: Rebar cage hanging in pit; 2x4s held by concrete spikes.

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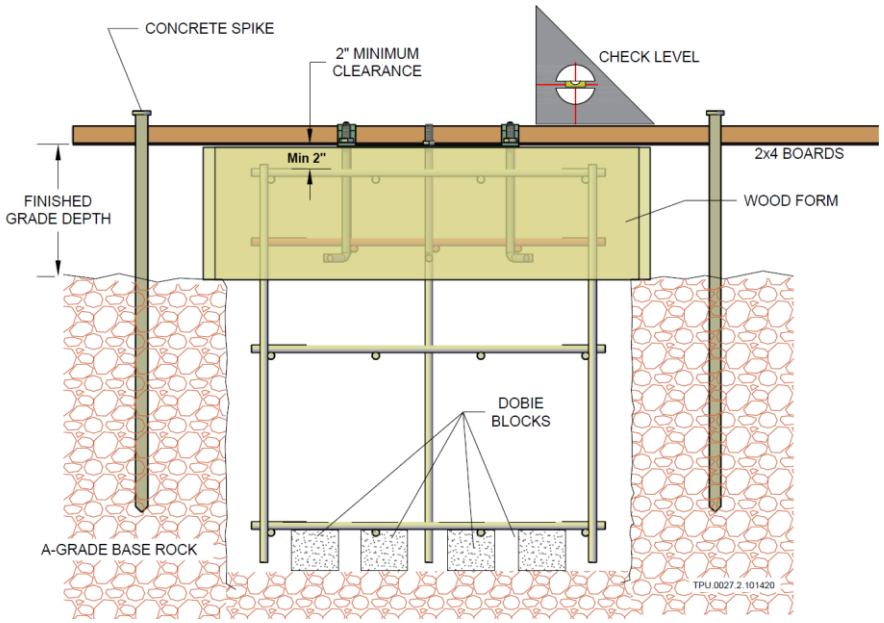


C.2 Layout LV/HV Electrical Conduits

Note: Consult NEC guidelines and any applicable local electrical codes for this section

- Secure the rebar cages rigidly in their respective pits.
- Layout the low voltage (LV) and high voltage (HV) conduits; Fig C.2.1
- Extend the conduits vertically through the center square of the anchor-bolt plate (conduit access hole) to minimum 12 inches above the top of the anchor-bolt plate.
- Insure that enough length of pull-wire (fish wire) is routed into each conduit between terminal points.
- Secure the conduits to the rebar cage(s) rigidly to prevent movement when concrete mix is poured.
- Coil the pull wires and cover the open ends of all conduits to prevent water, cement, and debris from entering the conduits.

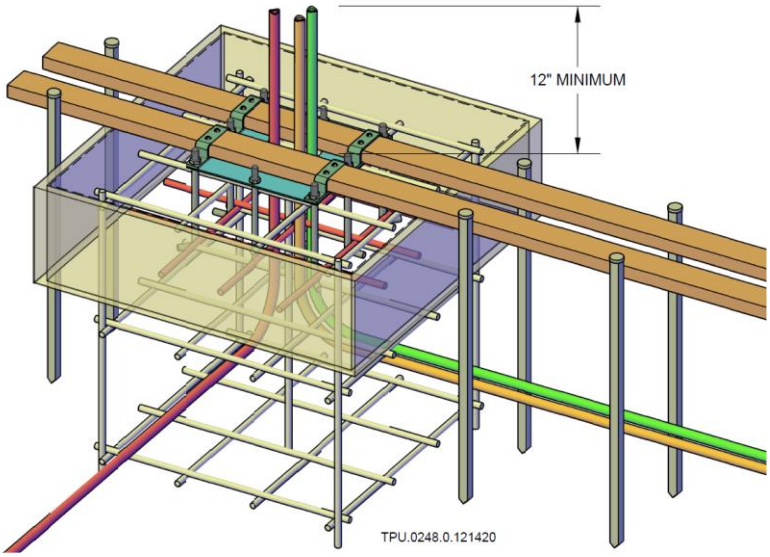


Fig C.2.1 Electrical conduits in place before concrete pouring

C.3 Pour Concrete Mix to form the Footing

- Check all alignments and levels once more before commencing cement pouring.
- Check that the rebar cage is rigidly supported and secured inside the pit against movement when concrete is poured.
- Pour concrete mix up to the lowest thread of the anchor-bolts; Fig C.3.1
- Pave the top surface of the concrete footing to level with finished grade; Fig C.3.2
- Avoid cementing over the lower nuts and washers of each anchor bolt.
- Remove the 2x4 long wood boards when concrete footing have cured and hardened.

Fig C.3.1 Pour concrete up to the lowest thread of each anchor bolts.

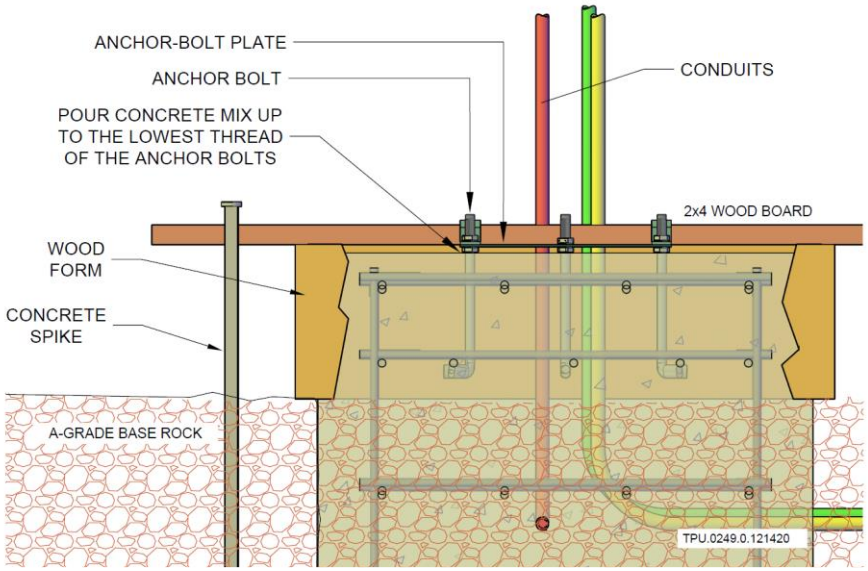
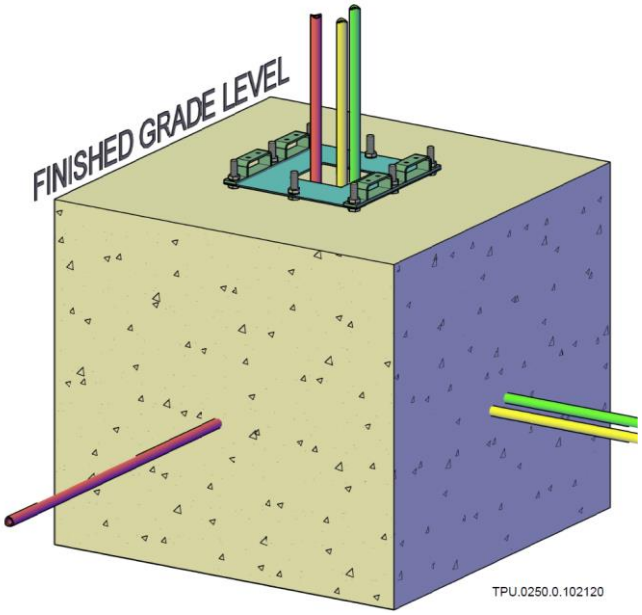


Fig C.3.2 Completed Concrete Footing with embedded HV/LV Conduit

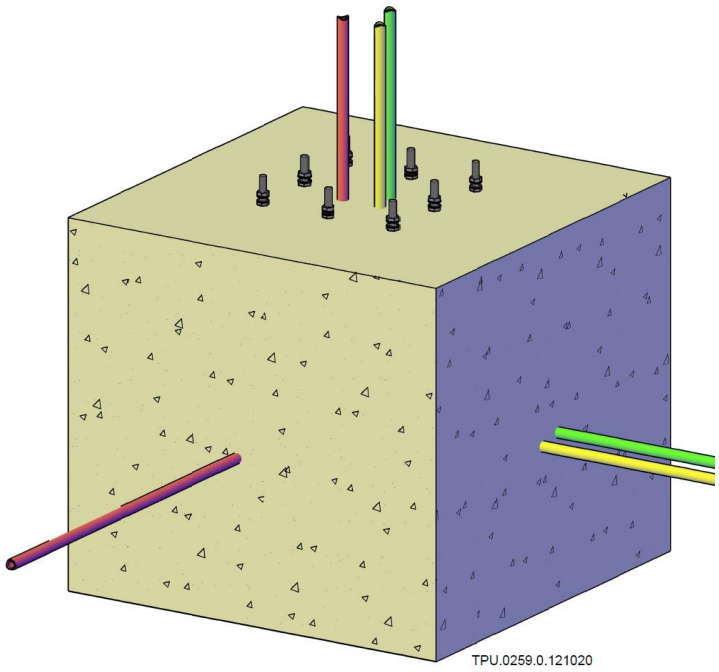


C.4 Remove all Mounting and Alignment Components

Note: Before removing the alignment jigs and mounting plate, check if the concrete footing(s) has cured and hardened to specifications; ensure all anchor bolts are rigidly incorporated to the concrete footing(s)

- Remove all components of the mounting and alignment system in the following order:
  - Remove all upper nuts and washers; set aside.
  - Remove the two(2) alignment jigs.
  - Remove the anchor-bolt plate(s).
  - Ensure all lower nuts and washers are turned in to the last thread on each anchor bolt.
- Reinstall all upper washers and nuts.
- Apply heavy grease on all washers, nuts, and exposed part of the anchor bolts.
- If installation of operator(s) is scheduled on a different day/date, wrap, or cover all bolt nuts, washers and other exposed parts of the anchor bolts with heavy gauge plastic bag or plastic sheet and seal to protect from the elements to prevent corrosion and rust on the steel nuts and anchor bolts.
- Cover the open ends of all conduits to prevent water and debris from getting in.

Fig C.4 Model 3 Operator concrete footing ready for operator installation



C.5 Existing Concrete Slab as Footing

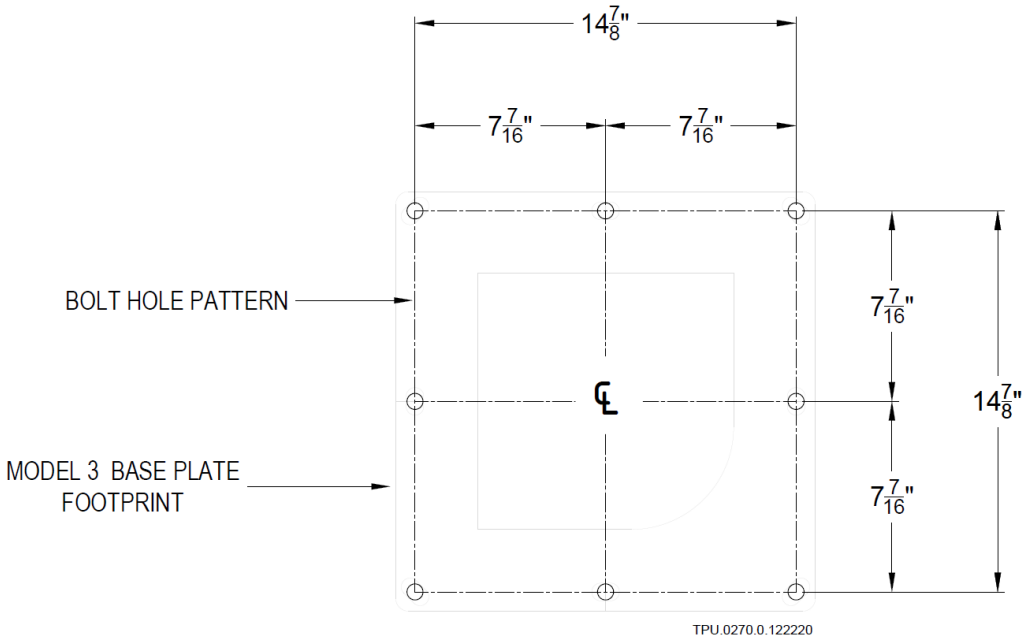
Consult your local architect or structural engineer if condition of an existing slab can be used as footing/foundation for Model 3 operator-gate installation. Refer to section B.7 Vehicle Gate Construction of the Model 3 Swing Gate System Handbook for weight load specifications of gate and operator.

If existing concrete slab qualifies for a safe and structurally sound footing/foundation for the operator-gate system, see the following guidelines to use existing slab as footing:

C.5.1 Adapt Existing Concrete Slab for Operator Footing

- Determine and establish the gate line across the existing slab.
- Snap a guide line between the two ends of the gate opening.
- Make a template or superimpose the bolt pattern directly on the slab where the operator is intended; use the center mark as reference marker; Fig C.5.1.a

Fig C.5.1.a Operator base plate anchor bolt hole pattern



- Along the gate line, plot and mark center-to-center distance between operator and receiving post if mounting a single panel gate system; Fig C.5.1.b, or
- If mounting two(2) operators, plot, and mark center-to-center distance between first operator and second operator along the gate line; Fig C.5.1.c

Fig C.5.1.b Align and square bolt pattern between operator and receiving post base.

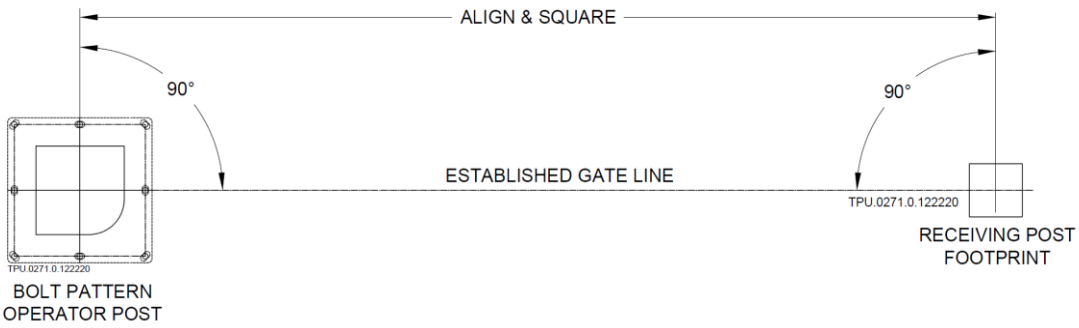
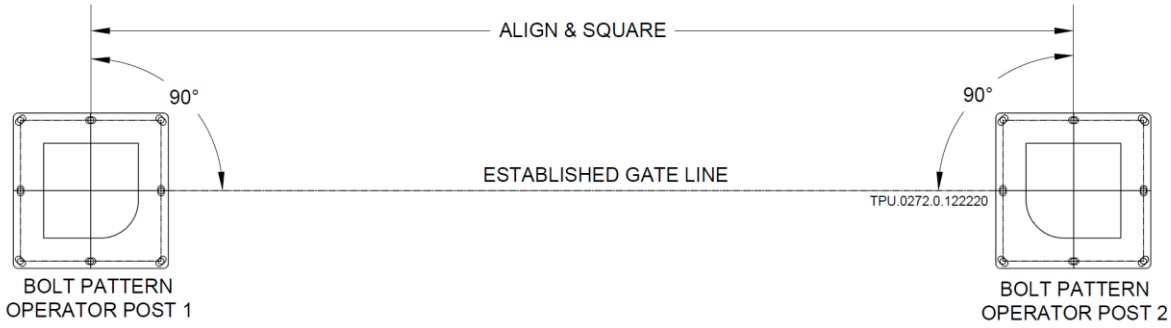


Fig C.5.1.c Align and square the bolt patterns between two(2) operators.



- The snapped guide line will serve as the alignment guide between operator and receiving post or between two(2) operators.

C.5.2 Drill and Embed Mounting Bolts

- Torxun recommends full thread mounting bolts or concrete expansion bolts for anchoring fasteners.
- Maximum anchor bolt diameter is 5/8”
- Anchor bolt length depends on depth of existing slab and specification of structural engineer or architect.
- Drill bolt holes in concrete with the specified bore diameter by structural engineer
- Use industrial concrete epoxy and epoxy gun dispenser to embed the anchor bolts.

D. Mount Operator-Gate System[7]

Note: If the TORXUN vehicle gate system arrives with gates attached, DO NOT REMOVE THE GATES. Lift the system and mount it as described below as a single unit. Be careful to attach the rigging straps to support the gates as well as the operator. Use sufficient manpower and equipment for the following installation steps. If the TORXUN operator does not have a gate attached, refer to **Section E. Mount Swing Gate** for guidelines on mounting a swing gate to the Model 3 which may be done after installing the tower.

D.1 Prep the conduits and wires

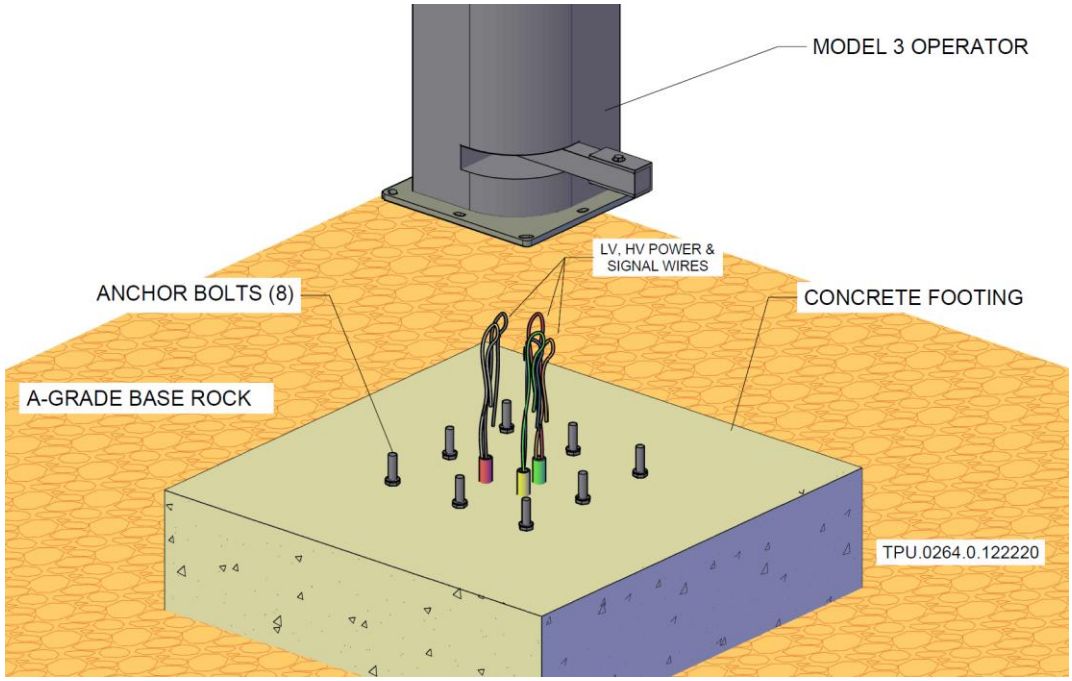
Before lowering the operator tower on to the footing:

- Collect and bundle the wires from each conduit correspondingly.
- Cut each conduit down to about 2" above the footing; take caution not to nick any wires.
- Remove the lower service access panel before proceeding to next steps in section D.2

D.2 Hoist Tower Over the Concrete Footing

- Use appropriate rigging equipment and labor to lift and transport the operator tower (and gate if attached) over to its concrete footing.
- Hover the operator base plate about two(2) feet above the mounting bolts; Fig D.2.1

Fig D.2.1 Hover the Tower over the Footing

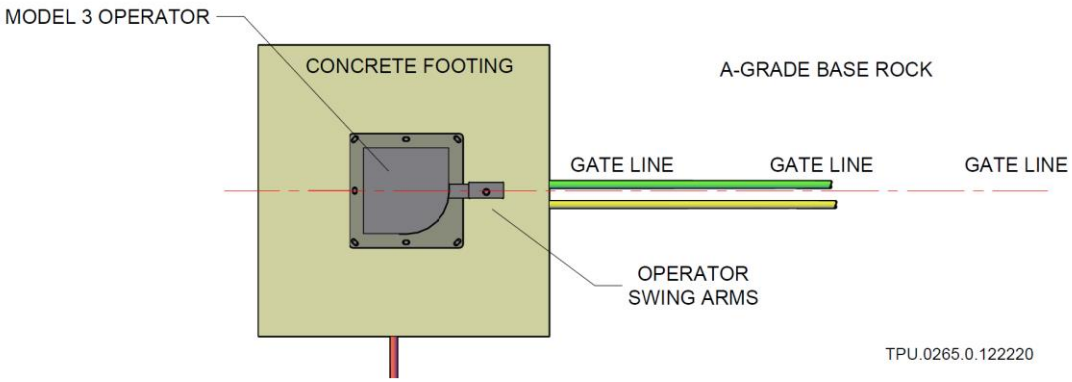


D.3 Orient Tower to the Gate Line

- While hanging, orient the operator (and gate if attached) to the gate line; Fig D.3
- Keep the operator steady before lowering it on to the footing after orienting it to gate line.
- Ensure that the electrical conduits at the footing are cut down to size as per D.1 above.

[7] This section applies to Model 3 Swing Gate System with or without a swing gate attached to the operator.

Fig D.3 (Plan view) Orient the tower and gate (if attached) to gate line

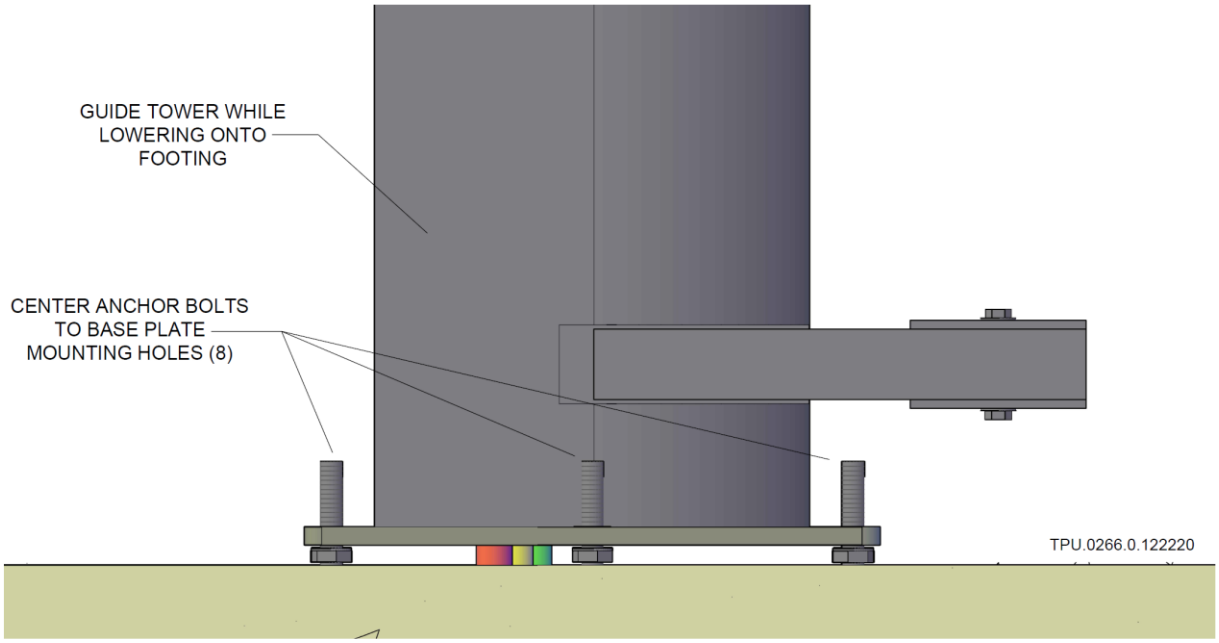


D.4 Lower the Tower for Mounting

- Start to lower the operator slowly.
- Have a hand to guide all the wire bundles from the bottom of the tower through the base slots inside the tower; Fig D.4.1
- Thread the wires through the base plate slots, through chase up to the control cabinet unit; allow enough slack on all wires to go in to the control cabinet (continued in Section D.7)
- Proceed to lower further the operator slowly onto the footing, hand guided to match the base plate holes to the mounting bolts.
- Continue to lower the operator until all footing anchor bolts pass through to the base plate mounting holes and the operator rests squarely on the footing; Fig D.4.2

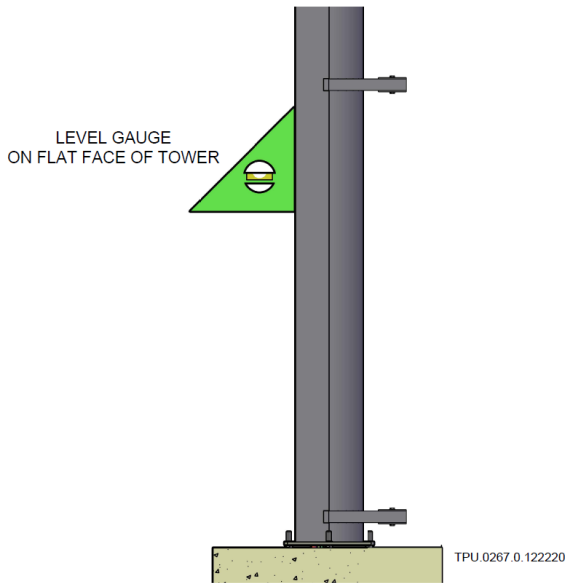
Fig D.4.1 Slot(s) provisions at base plates for wire-runs to the control cabinet

Fig D.4.2 Lower the Tower onto the anchor bolts



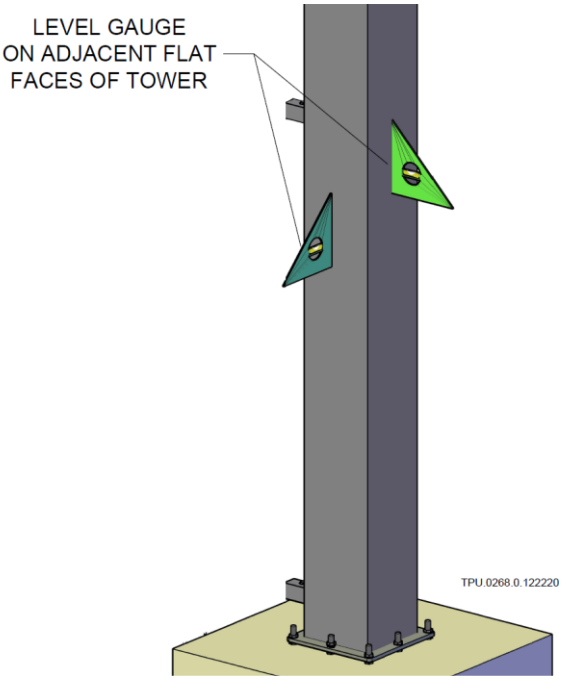
D.5 Square and Align the Operator (and gate if attached) vertically; Fig D.5.1

Fig D.5.1 Align the Tower vertically with bubble level gauge on the flat face of tower.



- Install the nuts and washers to each anchor bolt.
- Lightly tighten the four corner anchor bolts at the base plate
- Attach level gauges on two adjacent faces of the tower; Fig D.5.2
- Have a hand to constantly check vertical alignment of the tower while torquing each corner bolt in sequence.
- If needed, shim the tower base to align the tower correctly.
- Recheck the vertical alignment on two faces of the tower.
- Check vertical alignment of tower on N-S and W-E sides.
- The gate (if attached) should align vertically and square to the gate line at this point.

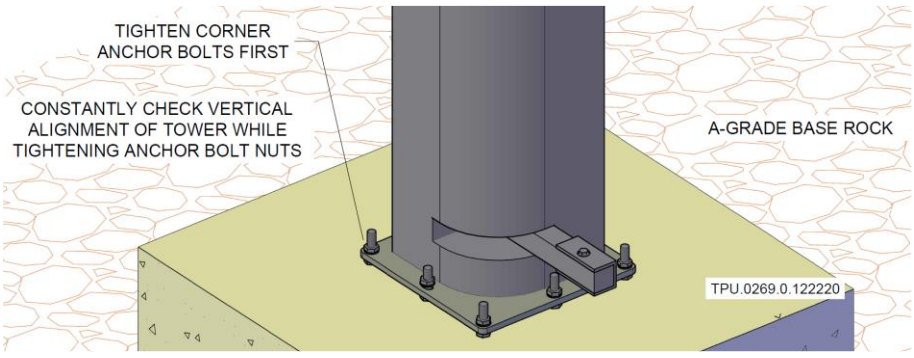
Fig D.5.2 Attach level gauges on two adjacent flat surfaces of the tower



D.6 Bolt Operator Tower Down to the Footing

- Continue to tighten the four corner bolts on the base plate maintaining a constant check on the level gauge reading of “0 bubble”.
- Proceed to tighten the middle anchor bolts on the bas plate; Fig D.6

Fig D.6 Bolt down the tower onto its footing



D.7 Route all Wirings to Operator Control cabinet

- Remove the upper service access panel (8 screws)
- Route the wires all the way up to the control cabinet
- Refer section B.10 of the Model 3 Swing Gate System Handbook for instructions on wiring the Model 3 operator including earth-grounding of the operator tower.

E. Mount The Swing Gate[8]

E.1 Move Swing Gate to Operator Tower

- Move swing gate as close as possible to the swing arms of the operator; Fig E.1.1
- Place the swing gate on several wood blocks to shore-up the bottom of the gate to the level of the lower swing arm of the operator; Fig E.1.2
- Use heavy clamps to secure the swing gate to the upper and lower swing arms of the operator.
- Adjust the gate to the required alignment shown in Fig E.1.3

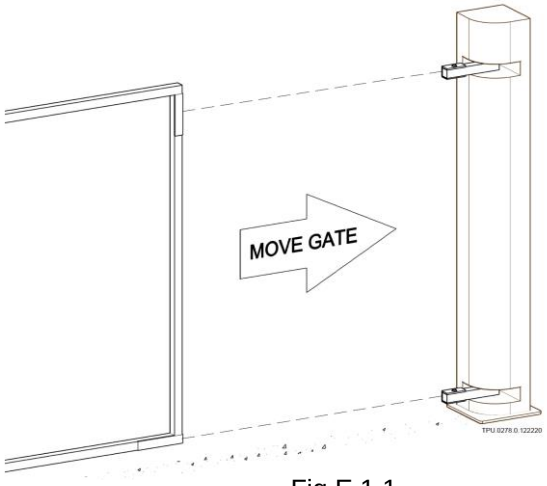


Fig E.1.1

Fig E.1.1 Move the swing gate.

- Use appropriate equipment and manpower to safely move gate panel towards the operator.
- Place wood blocks under the gate panel to rest on while moving gate closer to the operator; Fig E.1.2

Fig E.1.2 Shore up the Gate

- Shore up the gate panel with appropriate size wood blocks;
- Move gate to get the backing plates closer to the U-brackets on the upper and lower swing arms of the operator.
- Adjust wood blocks or use shims to approximately match the U-brackets and backing plates (along center lines of brackets)
- Temporarily clamp the gate frame to the upper and lower U-brackets
- Adjust the gate horizontal and vertical position to the specified alignment clearances in Fig E.1.3
- Tack or spot weld the backing plates to the U-brackets
- Final check and/or adjust the alignment of the gate frame against the operator inner face of 2” gap and corner of lower backing plate matching the corner of the lower U-bracket.
- Complete the mounting process of the gate panel by applying full fillet welds around the U-bracket against the backing plates; see Section E.2 Welding Specifications.

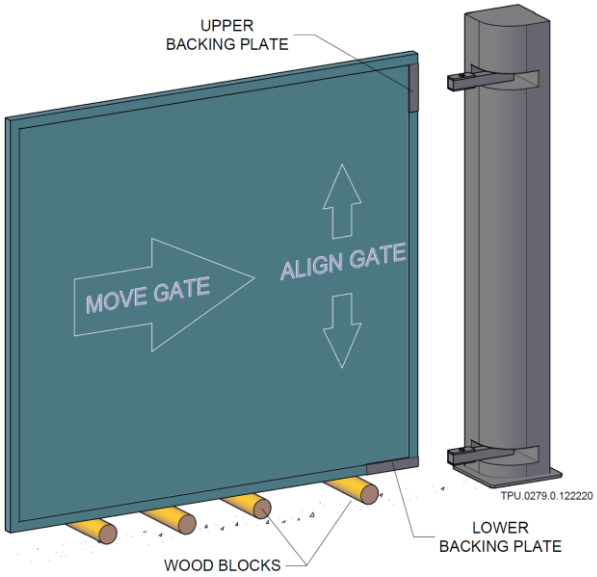
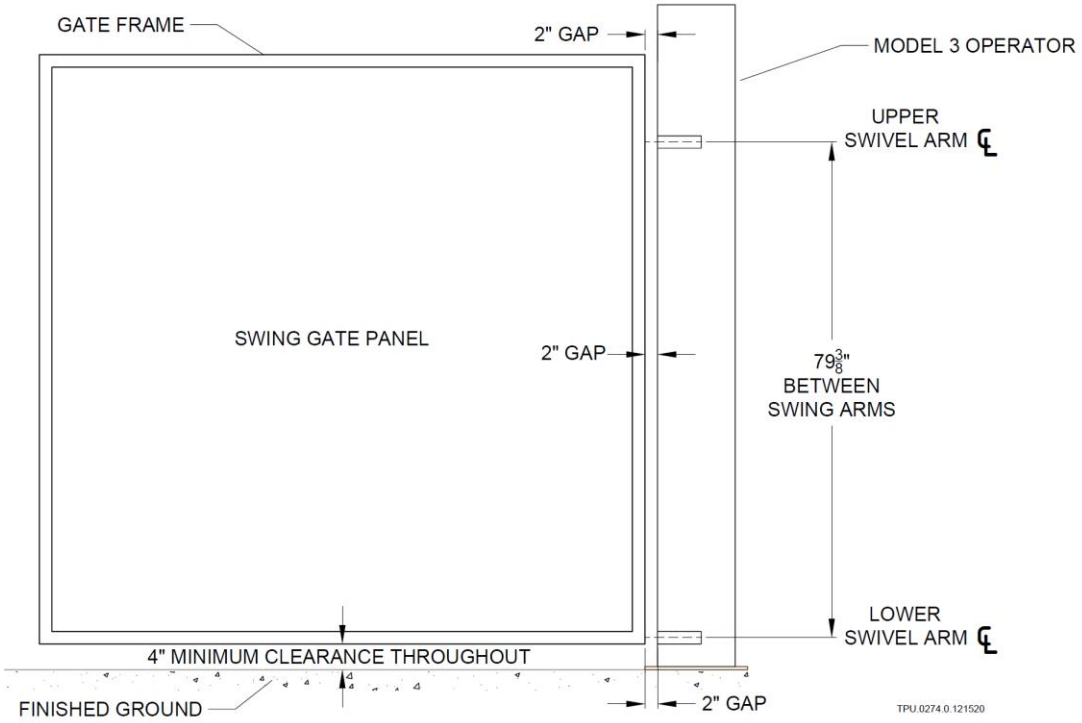


Fig E.1.2

[8] Skip this Section if Model 3 operator is delivered with gate unit attached.

Fig E.1.3 Required clearances in mounting gate frame to Model 3 operator



E.2 Welding Specifications to Mount Swing Gate to Operator Tower

Note: DO NOT WELD THE UPPER AND LOWER U-BRACKETS TO THE OPERATOR SWING ARMS

Fig E.2.1 Weldments: Upper u-bracket to upper backing plate

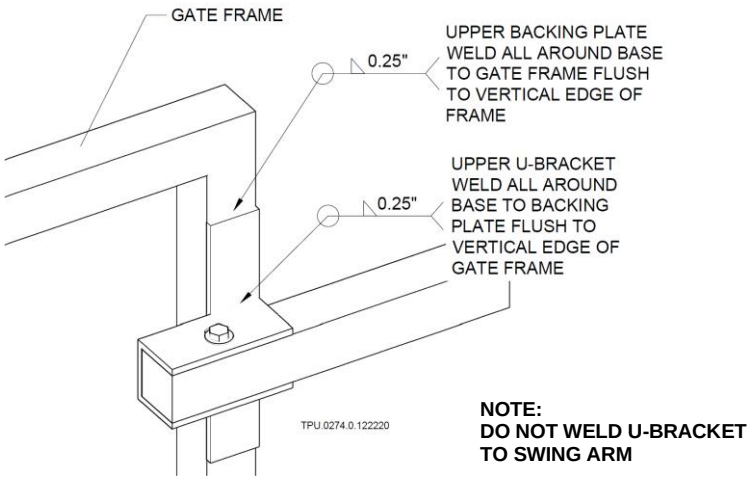
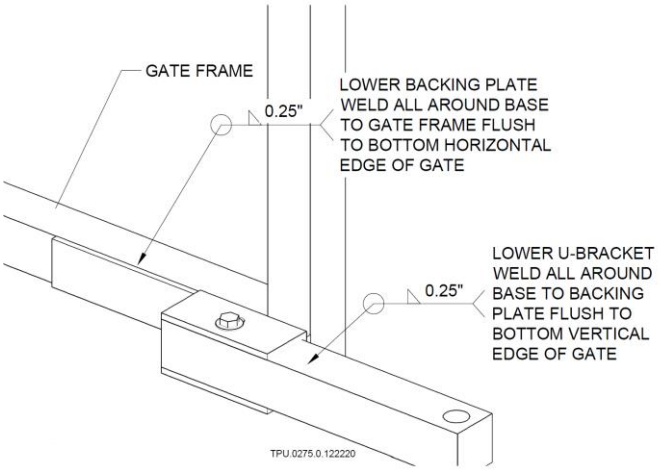


Fig E.2.2 Weldments: Lower u-bracket to lower backing plate



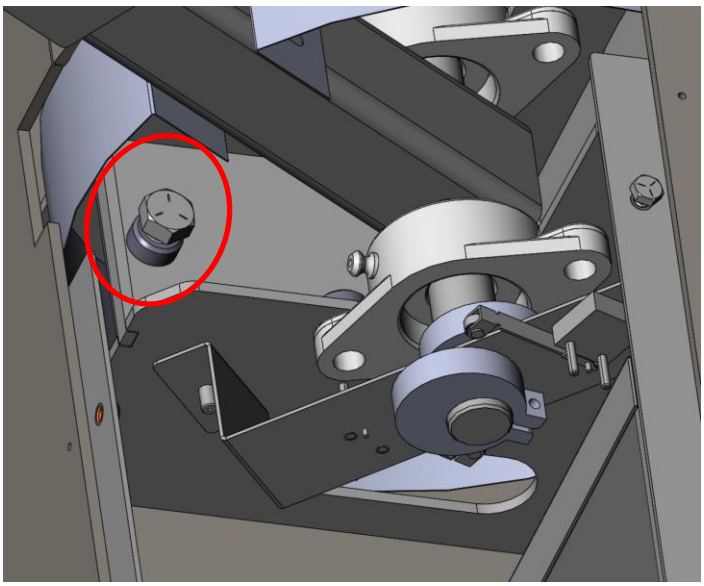
NOTE:
DO NOT WELD U-BRACKET
TO SWING ARM

E.3 Square and Align Swing Gate

Align the gate panels to the gate line by adjusting the stop bolt found in the upper swing arm assembly of the Model 3 operator; Fig E.3.1.

- Locate the stop bolt around the upper swing arm of the operator.
- Loosen the stop bolt initially.
- Operate the gate to open and close.
- Adjust the stop bolt accordingly at the close position; see E.3.1.a and E.3.1.b
- You may need to repeat the process a few times.

Fig E.3.1 Stop Bolt

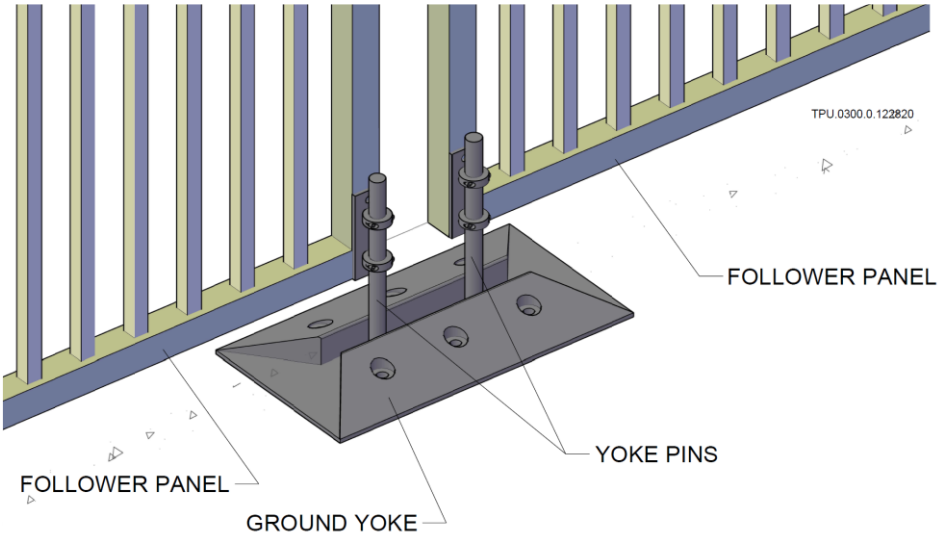


E.3.1.a For a single gate (folding or single panel), adjust the stop bolt so it stops movement at the point where the receiving end of the gate panel aligns with the receiving post or structure.

E.3.1.b For a biparting gate system (folding or single panels), adjust the stop bolt so it stops movement at the point where the opposing follower panels of the gates align with each other at the center of the gate system.

If the gate system is equipped with the TORXUN LockDock[9] (ground yoke), adjust the stop bolt at the point where the yoke pins on the follower panels sit centered in the LockDock groove. Fig E.3.2

Fig E.3.2 Yoke pins latched on the ground yoke (Torxun LockDock)



F. Folding Mechanisms

Folding mechanisms are required for bifolding gates (single or double panel bifolds) to work with the Model 3 operator. Proper installation of these equipment must be observed and complied with for trouble-free operation.

F.1 For bifolds to be equipped with the Torxun FlexGuide folding mechanism, refer to:
APPENDIX II – FlexGuide Installation Guide (included in the Torxun FlexGuide Kit)

F.2 For bifolds to be equipped with the Torxun FlexArm folding mechanism, refer to:
APPENDIX III – FlexArm Installation Guide (included in the Torxun FlexArm Kit)

NOTE: Refer back to Section B.10 Electrical Installation Guide

[9] LockDock is ordered separately; it is not part of the Model 3 Operator kit

APPENDIX V

APEX II PROGRAMMING GUIDE

(012521)

The TORXUN Model 3 operator uses the APEX II control board. The APEX II is a proven UL325 listed control board well suited to operating the Model 3 and all the various safety and access control devices you will install in any automated vehicle gate system.

TORXUN Vehicle Access Technologies
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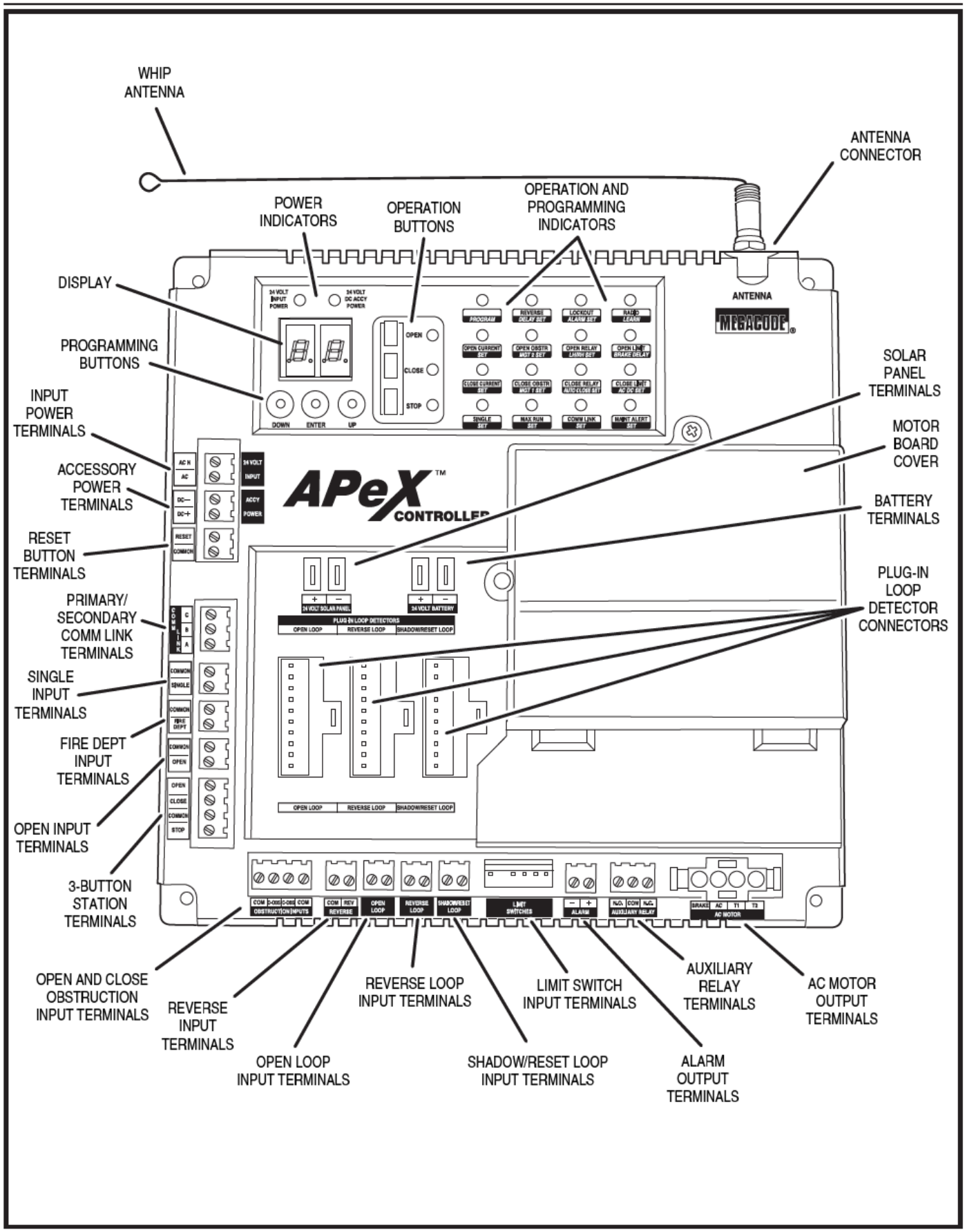
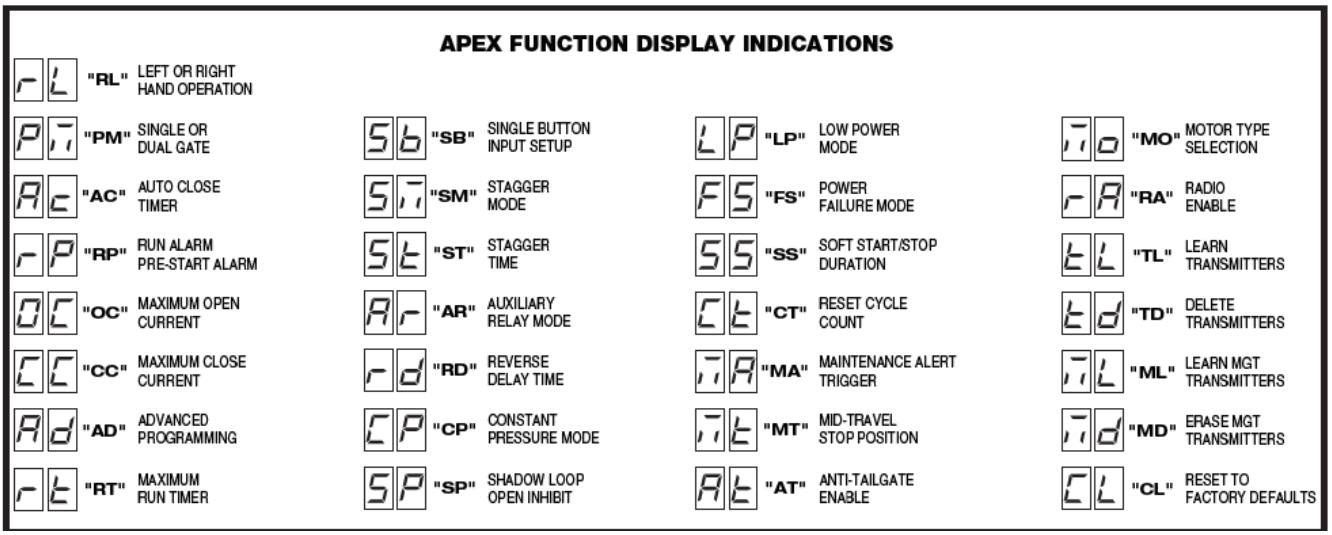
Controller Features



Indicator Descriptions

INDICATOR DEFINITION		INDICATION WHEN LIT DURING NORMAL OPERATION	INDICATION WHEN LIT DURING PROGRAMMING
OPERATION	PROGRAMMING		
24 VOLT INPUT POWER		LOW VOLTAGE AC POWER IS PRESENT	
24 VOLT DC ACCY POWER		LOW VOLTAGE DC POWER IS PRESENT	
OPEN		OPEN SIGNAL PRESENT FROM THE INTERNAL RECEIVER OR AN EXTERNAL DEVICE CONNECTED TO THE OPEN INPUT TERMINAL	
CLOSE		CLOSE SIGNAL IS PRESENT FROM A DEVICE CONNECTED TO THE CLOSE INPUT TERMINAL	
STOP		STOP INPUT TERMINAL IS OPEN AND NOT CONNECTED TO COMMON	
PROGRAM			CONTROLLER IS IN PROGRAMMING MODE
REVERSE	DELAY SET	SIGNAL FROM REVERSING DEVICE IS PRESENT	SET REVERSE DELAY TIME
LOCKOUT	ALARM SET	CONTROLS AND OPERATOR ARE LOCKED OUT BECAUSE OF EXISTING TROUBLE CONDITION	SET RUN ALARM AND PRE-START ALARM
RADIO	LEARN	BUILT-IN RECEIVER IS DETECTING A RADIO SIGNAL FROM A REMOTE CONTROL	TRANSMITTERS CAN BE ENTERED INTO MEMORY (UP TO 40 TRANSMITTERS)
OPEN CURRENT	SET	MOTOR CURRENT HAS EXCEEDED THE OPEN CURRENT SETTING WHILE OPENING	SET MAXIMUM OPEN CURRENT
OPEN OBSTR	MGT 2 SET	OPEN OBSTRUCTION TERMINAL CONNECTED TO COMMON BY BEAM OR SAFETY EDGE, OR SIGNAL FROM MGT OBSTACLE TRANSMITTER	SET MGT #2 FUNCTION
OPEN RELAY	LH/RH SET	OPEN RELAY IS ACTIVATED	SET LEFT-HAND RIGHT-HAND OPERATION
OPEN LIMIT	BRAKE DELAY	OPEN LIMIT SWITCH IS ACTIVATED	
CLOSE CURRENT	SET	MOTOR CURRENT HAS EXCEEDED THE CLOSE CURRENT SETTING WHILE CLOSING	SET MAXIMUM CLOSE CURRENT
CLOSE OBSTR	MGT 1 SET	CLOSE OBSTRUCTION TERMINAL CONNECTED TO COMMON BY BEAM OR SAFETY EDGE, OR SIGNAL FROM MGT OBSTACLE TRANSMITTER	SET MGT #1 FUNCTION
CLOSE RELAY	AUTO CLOSE SET	CLOSE RELAY IS ACTIVATED	SET AUTO-CLOSE TIME
CLOSE LIMIT	AC DC SET	CLOSE LIMIT SWITCH IS ACTIVATED	SET MOTOR TYPE
SINGLE	SET	SINGLE TERMINAL CONNECTED TO COMMON BY AN EXTERNAL PUSHBUTTON OR RADIO	SET SINGLE BUTTON INPUT FUNCTION
MAX RUN	SET	MAXIMUM RUN TIMER HAS BEEN EXCEEDED	SET MAXIMUM RUN TIME
COMM LINK	SET	DUAL OPERATOR CONNECTION DETECTED, BLINKS IF CONNECTION HAS FAILED	
MAINT ALERT	SET	MAINTENANCE IS REQUIRED ON OPERATOR	SET MAINTENANCE ALERT CYCLE COUNT

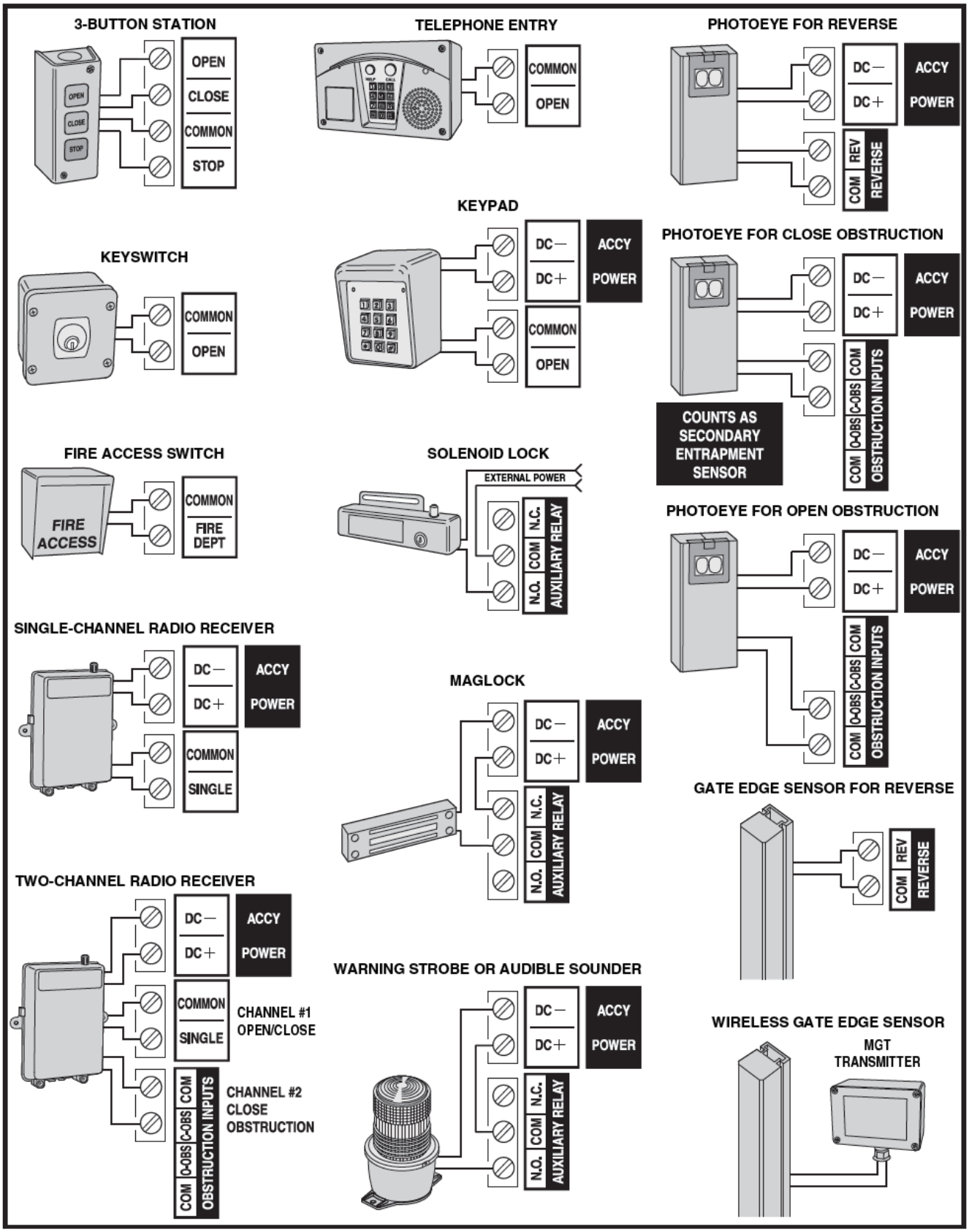
APEX FUNCTION DISPLAY INDICATIONS



Terminal Descriptions

TERMINAL	GROUP	FUNCTION
AC N AC	24 VOLT INPUT	FACTORY CONNECTED TO 24 VAC FROM TRANSFORMER OR 24 VDC FROM CONTINUOUS DUTY DC SUPPLY.
DC - DC +	ACCESSORY POWER	PROVIDES 24 VOLT DC POWER FOR ACCESSORIES. (.5A MAX)
RESET COMMON	RESET BUTTON	FACTORY CONNECTED TO THE CONTROLLER'S RESET BUTTON.
C B A	COMM LINK	FOR 3-WIRE NETWORK CONNECTION TO SECOND OPERATOR IN DUAL GATE INSTALLATIONS.
COMMON SINGLE	SINGLE BUTTON INPUT	CONNECT TO NORMALLY OPEN SWITCH FOR SINGLE BUTTON OPERATION. ALTERNATES BETWEEN OPEN-CLOSE OR OPEN-STOP-CLOSE DEPENDING ON PROGRAMMING.
COMMON FIRE DEPT	FIRE BOX INPUT	CONNECT TO NORMALLY OPEN SWITCH IN FIRE BOX FOR FIRE DEPARTMENT ACCESS.
COMMON OPEN	OPEN INPUT	CONNECT TO NORMALLY OPEN DEVICES (KEYPAD, CARD READER, KEYSWITCH, TELEPHONE ENTRY SYSTEM) TO OPEN THE GATE. A CONSTANT OPEN INPUT WILL OVERRIDE THE MID-TRAVEL STOP AND HALT THE AUTO CLOSE TIMER UNTIL RELEASED.
OPEN CLOSE COMMON STOP	3-BUTTON STATION INPUT	CONNECT TO 3-BUTTON STATION FOR OPEN-CLOSE-STOP CONTROL. A CONSTANT OPEN INPUT WILL OVERRIDE THE MID-TRAVEL STOP AND HALT THE AUTO CLOSE TIMER UNTIL RELEASED.
COM O-OBS	OPEN OBSTRUCTION INPUT	CONNECT TO NORMALLY OPEN DEVICES (GATE EDGE, PHOTO BEAM) TO DETECT AN OBSTRUCTION DURING OPENING. WHILE GATE IS MOVING, ANY OPEN OBSTRUCTION SIGNAL 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 OBSTACLE SIGNAL OCCUR AGAIN PRIOR TO REACHING A LIMIT, THE GATE WILL STOP AGAIN, LOCKOUT, AND SOUND THE CONTINUOUS TONE ALARM.
C-OBS COM	CLOSE OBSTRUCTION INPUT	CONNECT TO NORMALLY OPEN DEVICES (GATE EDGE, PHOTO BEAM) TO DETECT AN OBSTRUCTION DURING CLOSING. WHILE GATE IS MOVING, ANY CLOSE OBSTRUCTION SIGNAL WILL CAUSE THE GATE TO STOP, THEN REVERSE AND TRAVEL TO THE FULL OPEN POSITION. SHOULD A OPEN OBSTRUCTION INPUT OR AN OPEN DIRECTION INHERENT ENTRAPMENT CONDITION OCCUR PRIOR TO THE GATE REACHING THE OPEN LIMIT, THE OPERATOR WILL LOCKOUT AND SOUND THE CONTINUOUS TONE ALARM. IF THE AUTO CLOSE TIMER IS SET, WHEN THE CLOSE OBSTRUCTION INPUT IS CLEARED, THE GATE WILL CLOSE WHEN THE AUTO CLOSE TIMER EXPIRES.
COM REV	REVERSE	CONNECT TO NORMALLY OPEN DEVICES TO CAUSE A REVERSAL WHEN THE GATE IS TRAVELING CLOSED. THE GATE WILL REVERSE TO THE FULL OPEN POSITION.
OPEN LOOP OPEN LOOP	OPEN LOOP	CONNECT TO OPEN LOOP/FREE EXIT LOOP. THE GATE WILL OPEN WHEN THE LOOP IS TRIGGERED, AND REMAIN OPEN AS LONG AS THE LOOP IS TRIGGERED. REQUIRES LOOP DETECTOR.
REVERSE LOOP REVERSE LOOP	REVERSE LOOP	CONNECT TO REVERSE LOOP. TRIGGERING THE LOOP WILL CAUSE A REVERSAL WHEN THE GATE IS TRAVELING CLOSED. THE GATE WILL REVERSE TO THE FULL OPEN POSITION. REQUIRES LOOP DETECTOR.
SHADOW/RESET LOOP SHADOW/RESET LOOP	SHADOW/RESET LOOP	CONNECT TO SHADOW/RESET LOOP TO KEEP THE GATE IN ITS FULLY OPEN POSITION AS LONG AS THE SIGNAL IS PRESENT. USED TO KEEP GATE OPEN WHILE VEHICLE IS PASSING THROUGH. REQUIRES LOOP DETECTOR.
- +	ALARM	FACTORY CONNECTED TO THE ALARM BEEPER.
N.O. COM N.C.	AUX RELAY	FOR CONNECTION TO AUXILIARY DEVICES (MAGNETIC LOCK, SOLENOID LOCK, STROBE LIGHT) FOR ACTIVATION (OR DEACTIVATION) DURING GATE OPERATION.
+ -	24 VOLT SOLAR PANEL	FOR CONNECTION TO 24 VOLT SOLAR PANEL FOR BATTERY CHARGING.
+ -	24 VOLT BATTERY	FACTORY CONNECTED TO BATTERIES IN DC MODEL OPERATORS.

Operator Accessory Connections



Basic Controller Programming

Programming Overview

The Controller can be programmed with various options for the operator. The programming fields are defined as "functions" that have "options". To make setup easier for the installer, the Controller's programming is divided into two groups: basic and advanced. The basic programming group contains the functions commonly used in most swing gate installations. The advanced programming group contains functions less commonly used (i.e. dual gate stagger delay, maximum run timer, etc.).

Entering Programming Mode

Enter programming mode by pressing the **UP** and **DOWN** buttons together for one second. While in programming mode the **PROGRAM** indicator will light.

Exiting Programming Mode

Exit programming mode at any time by pressing the **UP** and **DOWN** buttons together. The Controller will automatically exit programming mode after three minutes of inactivity.

Programming Keystrokes

(Typical Programming Method)

While in programming mode, press the **UP** or **DOWN** buttons to scroll through the programming functions. When the desired function is displayed press the **ENTER** button to display the currently set option for the function. **When an option is displayed, the decimal points are lit.**

To change the option, press and hold the **ENTER** button for 1 second. To indicate that an option is ready to be changed, the display will flash. While the display is flashing, press the **UP** or **DOWN** button to display the other options available for that function.

When the desired option is displayed, press the **ENTER** button to store it into memory. To select another function, press **ENTER**, **UP**, or **DOWN**.

Left or Right Hand Operation

The factory default is for right hand operation (operator on right side of the driveway when viewed from the inside of the gate). For left hand installations, program the Controller for left hand operation.

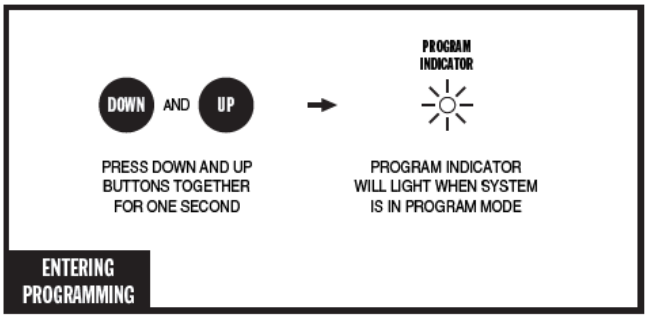
Dual Gate Enable

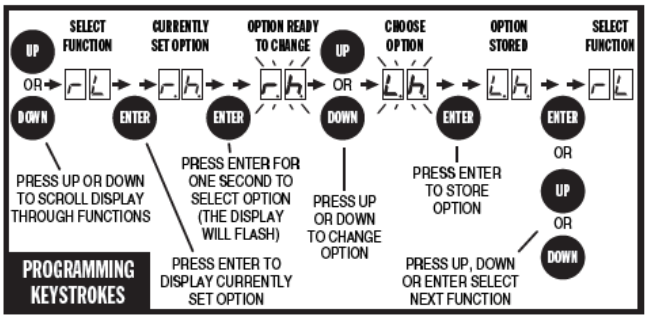
The factory default is for single gate operation. For dual gate operation, wire the two gate controllers together through the **COMM LINK** terminals (see Page 23) and enable dual gate operation with this programming step.

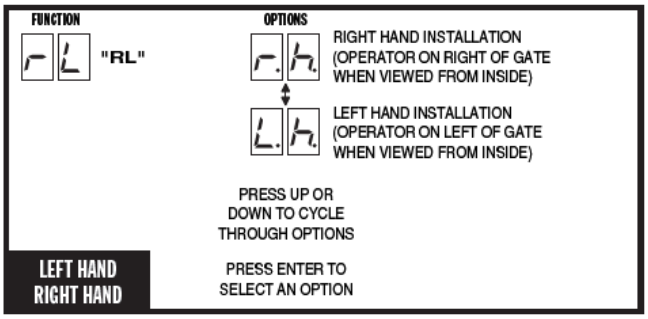
✓ ***NOTE:*** *The Mid-travel Stop feature is disabled when dual gate operation is enabled for paired units.*

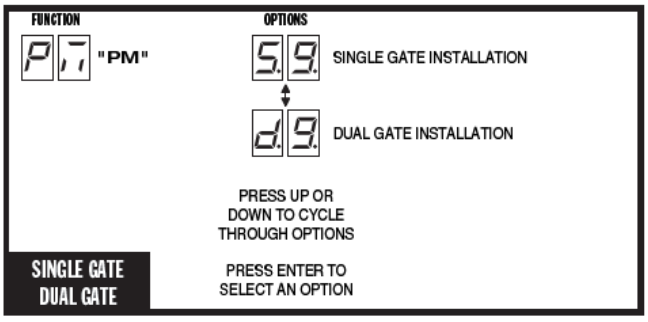
Auto Close Timer

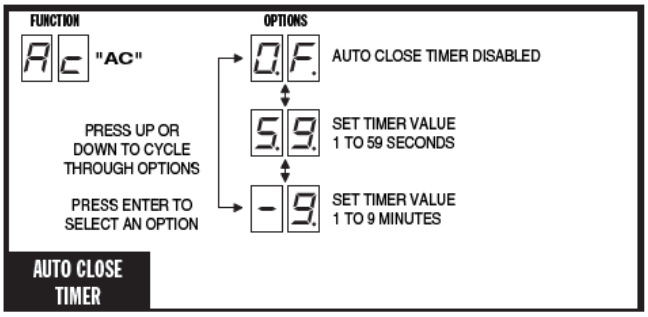
The factory default turns off the Auto Close Timer. The timer can be set from 1 to 59 seconds and from 1 to 9 minutes. When the Auto Close Timer is set, after opening, the gate will wait for the length of the Auto Close Timer then close automatically.









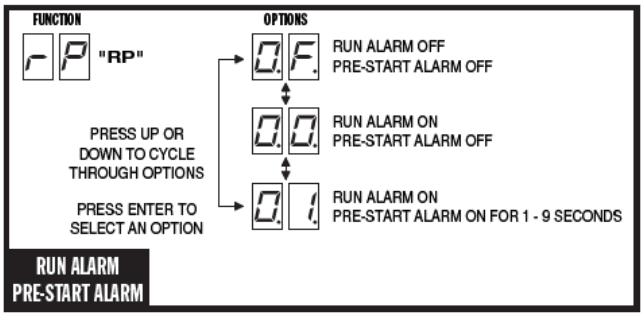


Basic Controller Programming (Cont.)

Run Alarm and Pre-start Alarm

The factory default is Run Alarm on and a 3-second Pre-start Alarm. The operator's beeper will sound 3 seconds before the operator starts. The options are:

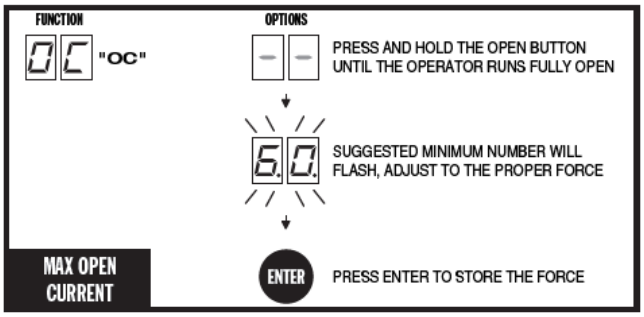
- **Run Alarm Off and Pre-start Alarm Off**
- **Run Alarm On and Pre-start Alarm Off**
- **Run Alarm On and Pre-start Alarm On for 1-9 Seconds**



Maximum Open Direction Current Setting

To detect obstacles or mechanical problems with the gate, the operator monitors its motor current. If the open current load exceeds the programmed maximum load range number, the operator will stop, reverse a short distance, then stop again. The Auto Close Timer will be disabled, and another open request will be required to start the operator again. If after restart, the overload or an open obstacle happens again before the open limit is reached, the operator will lockout and sound the alarm.

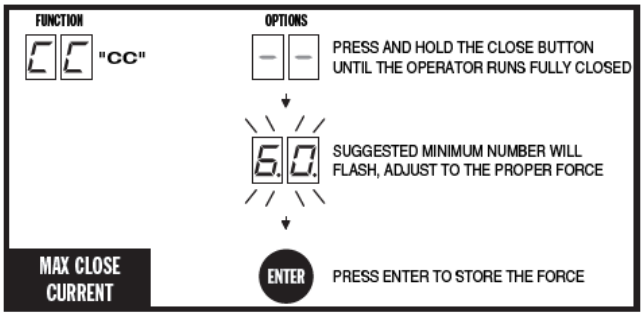
To measure the motor load used during opening, ***while this function is being displayed,*** push and hold the **OPEN** button to fully open the gate. During movement, the motor current will be displayed as a load number from 0 to 99. This number is useful for troubleshooting but not for setting the motor current. At the end of travel, a different number will flash. This number indicates the range above and below the average motor current during the run. Using the + and - buttons, set the programmed range number so that a minimal force (50-75 lbs.) will activate a reversal should an obstruction occur, but high enough to keep the gate moving under normal conditions without interruption.



Maximum Close Direction Current Setting

To detect obstacles or mechanical problems with the gate, the operator monitors its motor current. If the close current load exceeds the programmed maximum load range number, the operator will stop, reverse, and travel to the full open position. Should a open obstruction input or an open direction inherent entrapment condition occur prior to the gate reaching the open limit, the operator will lockout and sound the continuous tone alarm. Another close request will be required to start the operator again. If after restart, the overload or a close obstacle happens again before the close limit is reached, the operator will lockout and sound the alarm. If the auto close timer is set, when the close obstruction input is cleared, the gate will close when the auto close timer expires.

To measure the motor load used during closing, ***while this function is being displayed,*** push and hold the **CLOSE** button to close the gate. During movement, the motor current will be displayed as a load number from 0 to 99. This number is useful for troubleshooting but not used for setting the motor current. At the end of travel, a different number will flash. This number indicates the range above and below the average motor current during the run. Using the + and - buttons, set the programmed range number so that a minimal force (50-75 lbs.) will activate a reversal should an obstruction occur, but high enough to keep the gate moving under normal conditions without interruption.

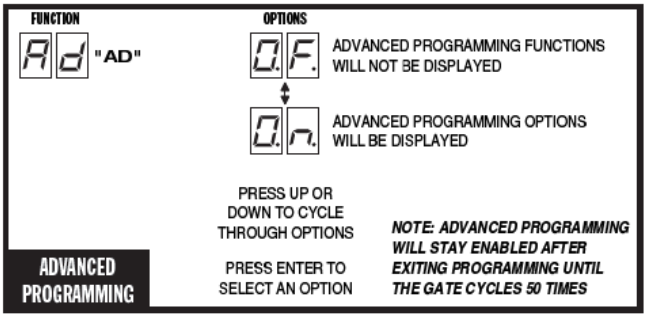


Advanced Controller Programming

Entering Advanced Programming Mode

To access and program the Advanced Programming functions, for each programming session, Advanced Programming must be enabled.

After exiting programming, the Advanced Programming functions will be available on the programming display during the next programming session unless the operator has run 50 or more cycles. After that, Advanced Programming must be enabled again.

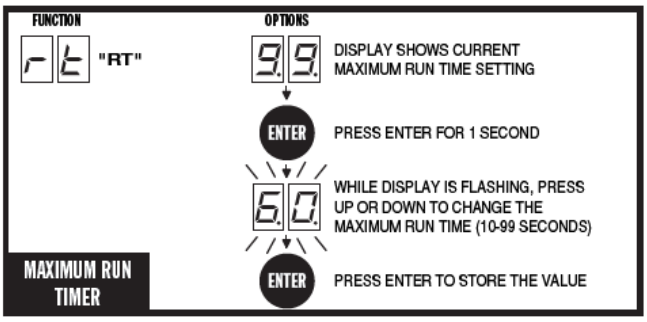


Maximum Run Time

The factory default for the Maximum Run Time (MRT) is 99 seconds. When the operator starts, a timer will begin counting. If a open or close limit is not reached or an obstacle or reversing input is not received before the timer expires, the operator will stop, the unit locks out and the alarm sounds. The timer can be set for 10 to 99 seconds, but should be left at 99 in most applications. Setting it too close to the actual run time may cause the time to expire with changing ambient temperature, gate conditions, etc…

If AC is present and an open or close limit is not reached or an obstacle or reversing input is not received before this timer exceeds MRT, the operator will stop, the unit locks out and the alarm sounds.

In the case that AC is not present and MRT expires, it will be ignored as long as the actual run time is under 99 seconds. When the gate reached full open or full close position, MRT will be interpreted as fail safe/secure. EN05 will occur. If FS as set to fail safe, the gate will open. If FS is set to fail secure, the gate will close. However, if the actual run time is higher than 99, it will be interpreted as a physical mechanical problem, EN01 will occur and the gate will stop immediately.

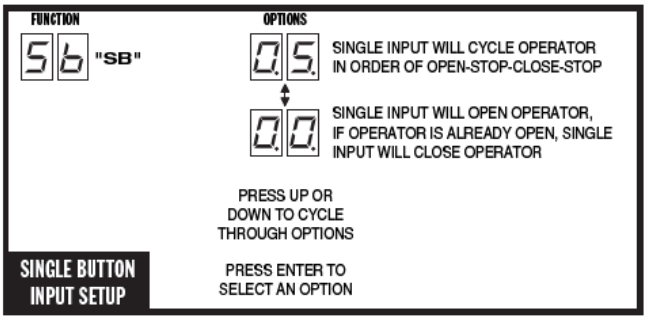


Single Button Input Setup

This function is used for selecting the operation for single button controls and radio receivers.

The factory default sets the **SINGLE** input terminal so successive inputs will cycle the operator in OPEN-STOP-CLOSE-STOP order.

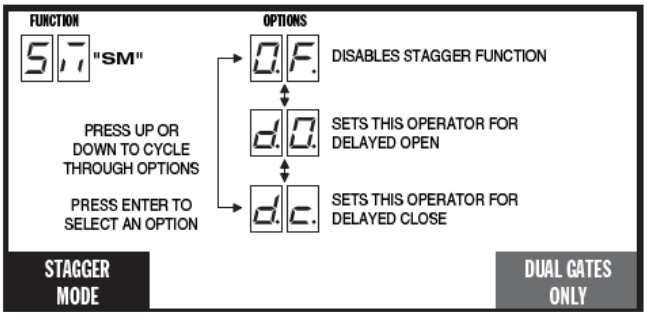
Alternately, the **SINGLE** input can be set to cause the gate to OPEN unless the gate is fully open. If the gate is fully open, the input will cause the gate to CLOSE.



Stagger Mode

This function is used in dual gate installations only. The factory default sets the Stagger Mode to OFF. In dual gate installations the two operators communicate through the 3-wire **COMM LINK** interface. When using the Stagger Mode, set one operator for delayed opening and the other operator for delayed closing. The Stagger Time programming function (see below) sets the length of the delay.

✓ ***NOTE:*** *This function will only be displayed if dual gate operation is selected.*

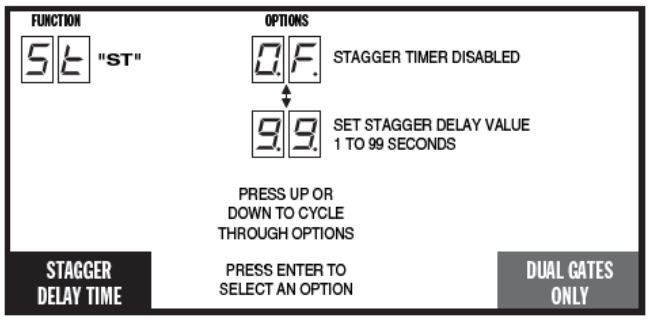


Advanced Controller Programming (Cont.)

Stagger Delay Time

This function is used in dual gate installations only. The factory default sets the Stagger Time to 0 seconds (OFF). The Stagger Time sets the delay for the Stagger Mode. The Stagger Delay Time can be set from 1-99 seconds.

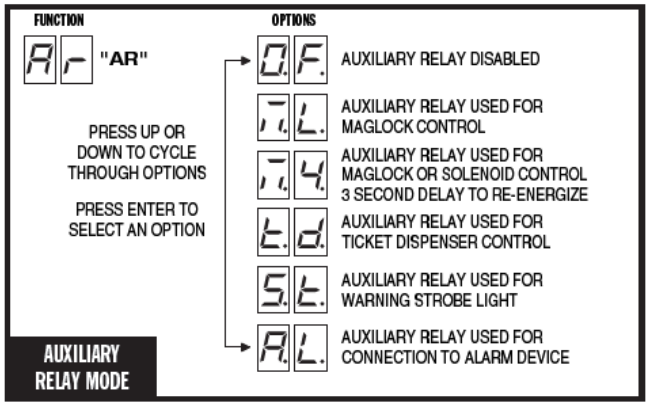
✓ ***NOTE:*** *This function will only be displayed if dual gate operation is selected.*



Auxiliary Relay Mode

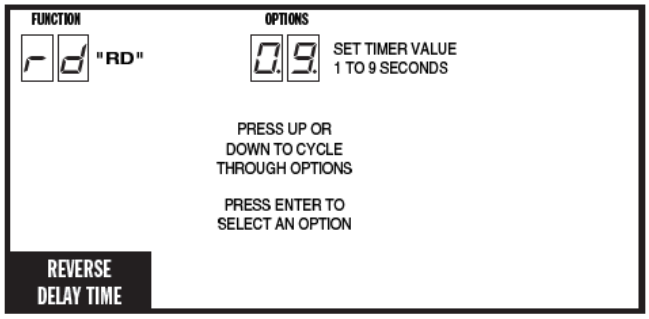
The Auxiliary Relay has normally open and normally closed contacts. The factory setting disables the Auxiliary Relay. The relay can be set for:

- **Maglock:** To deactivate a magnetic or solenoid gate lock, the relay will energize during any pending or actual gate motion (open only).
- **M4:** To deactivate a magnetic or solenoid gate lock, the relay will energize during any pending or actual gate motion (open only). 3 seconds after the gate starts to move, the relay will de-energize. This option is used for higher current solenoid locks.
- **Ticket Dispenser:** The relay will energize while the gate is moving in the open direction and at the full open limit, or in an entrapment condition.
- **Strobe:** To activate a warning strobe light, the relay will energize during any pending or actual gate motion (either open or close).
- **Alarm:** The relay will energize if the gate is manually forced open from the full closed position.



Reverse Delay Time

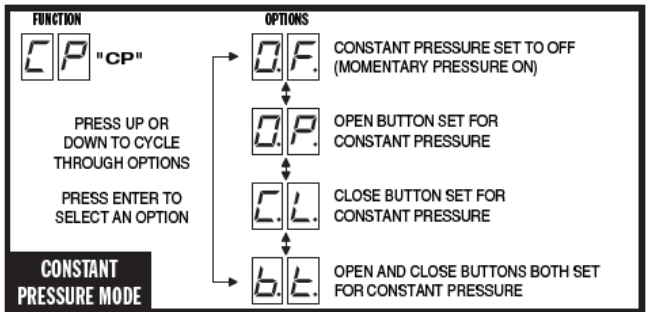
The factory default sets the Reverse Delay to 1 second. The operator will wait the length of the delay before reversing direction. This feature will not change the reversal time when the operator is responding to an entrapment condition from an obstruction input or inherent entrapment protection sensor. The Reverse Delay can be set from 1 to 9 seconds. Heaver gates require a longer delay to allow time for the gate to stop.



Constant Pressure Mode

The factory default allows momentary pressure on a control station's **OPEN** or **CLOSE** button to cycle the operator. The controller can be set to require constant pressure on the **OPEN**, **CLOSE**, or both buttons to run the operator.

✓ ***NOTE:*** *If a button is set for constant pressure, and it is released before the operator reaches the open or close limit, the operator will stop the gate at its current position.*

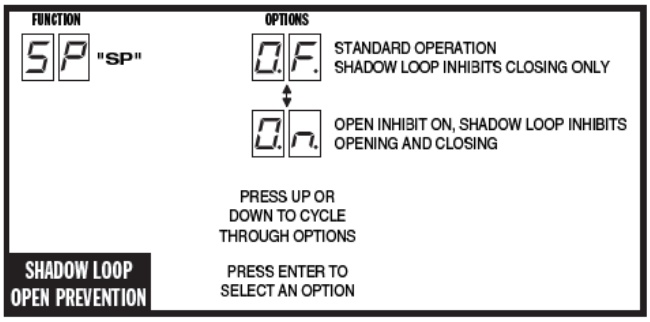


Advanced Controller Programming (Cont.)

Shadow Loop Open Prevention

If the shadow loop is triggered, it always prevents the gate from *closing* if the Auto Close Timer activates or a CLOSE command is given while the gate is at the full open position.

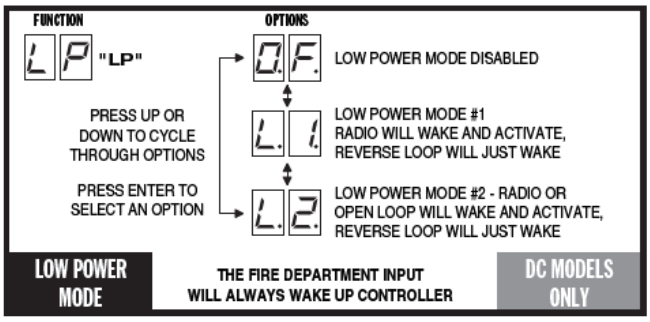
The controller can also be set to prevent the gate from *opening* if the shadow loop is triggered while the gate is at the close limit position. This prevents a swing gate from opening into a vehicle if it's parked near the gate on the inside.



Low Power Mode

This function is only used with DC swing gate Model SWD. The factory default disables the Low Power Mode. When Low Power Mode is enabled, and AC power fails, the controller will assume Low Power Mode after 60 seconds of gate inactivity. Low power mode turns off all accessory power and indicators. Only inputs from the radio receiver, reverse loop, open loop (optional by programming), fire department input, or restoring AC power will wake the Controller from Low Power Mode. Programming Mode can still be accessed while the Controller is awake in Low Power Mode.

✓ ***NOTE:*** *This function will only be displayed in Model SWD operators.*



Power Failure Mode

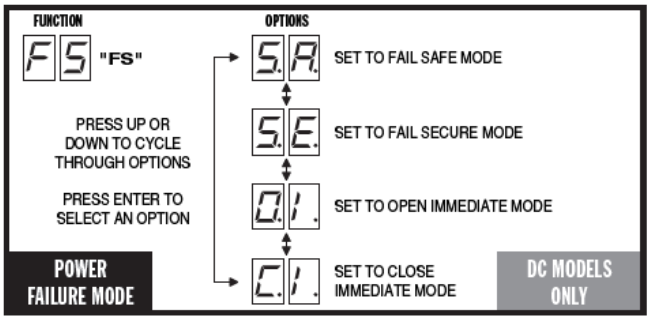
This function is only used with DC swing gate Model SWD. The factory default is set for Fail Safe, alternately the Controller can be set for Fail Secure, Open Immediate, or Close Immediate.

- **Fail Safe:** If the AC power fails and the battery voltage drops below approximately 22 Volts, 5 seconds later the operator will cycle open if not already open. When AC power is restored, or the battery gets charged by solar panels, the operator will resume normal operation and auto-close if programmed to do so.
- **Fail Secure:** If the AC power fails and the battery voltage drops below approximately 22 Volts, 5 seconds later the operator will cycle closed if not already closed. When AC power is restored, or the battery gets charged by solar panels, the operator will resume normal operation.

✓ ***NOTE:*** *Fail Safe and Fail Secure are disabled if Stagger Mode is enabled.*

- **Open Immediate:** If the AC power fails, the operator will cycle open if not already open and cease operation. When AC power is restored, the operator will resume normal operation and auto-close if programmed to do so.
- **Close Immediate:** If the AC power fails, the operator will cycle closed if not already closed and cease operation. When AC power is restored, the operator will resume normal operation.

✓ ***NOTE:*** *This function will only be displayed in Model SWD operators.*



Advanced Controller Programming (Cont.)

Soft Start/Stop Duration

This function is only used with DC swing gate Model SWD. This function causes the operator to start and stop the DC motor slowly reducing gate wear and tear (at the full open or closed positions only). The factory default sets the Soft Start/Stop Duration to 3 seconds. The Soft Start/Stop Duration can be set from 1 to 10 seconds.

✓ ***NOTE:*** *Changing the* Soft Start/Stop Duration will reset the open and close current setting value to zero. It will be necessary to reprogram maximum open and close current settings.

✓ ***NOTE:*** *This function will only be displayed in Model SWD operators set for DC motor operation with soft start motor selection.*

Reset Cycle Count

The Controller counts of the number of times the operator has been cycled full open and close. The cycle count can be displayed. The display will scroll the cycle count number, flashing two digits at a time from left to right.

To reset the Cycle Count, press and hold the **ENTER** button for 2 seconds while the Cycle Count is displayed.

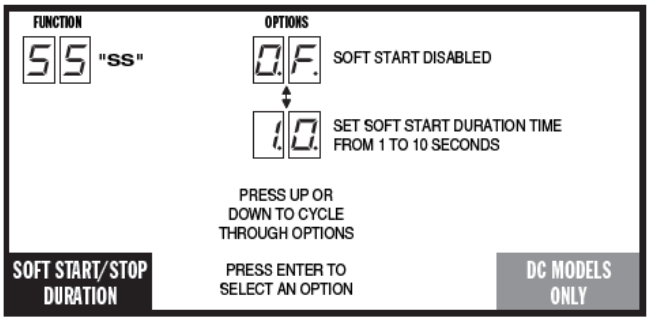
If the Maintenance Alert has been triggered, resetting the Cycle Count will also reset the Maintenance Alert indicator.

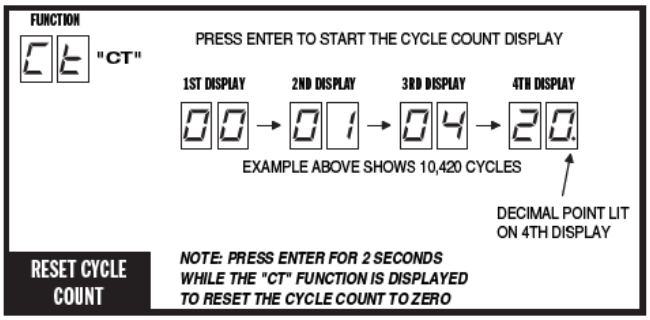
Maintenance Alert Trigger

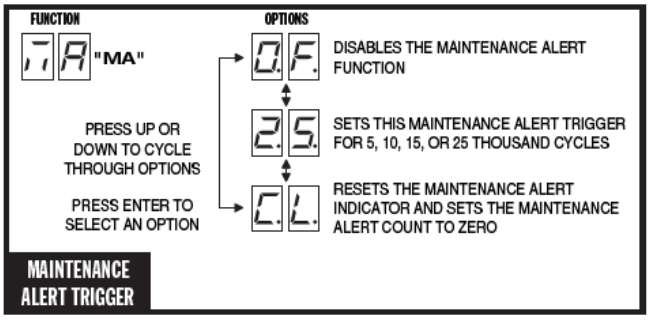
The Controller has a **MAINT ALERT** indicator that can be programmed to light when the number of activations exceeds a set number of cycles.

The factory default sets the Maintenance Alert Trigger to 10,000 cycles. The Maintenance Alert Trigger can be programmed for 5, 10, 15, or 25 thousand cycles.

The Maintenance Cycle Count can be reset independently from the operator's absolute Cycle Count.







Advanced Controller Programming (Cont.)

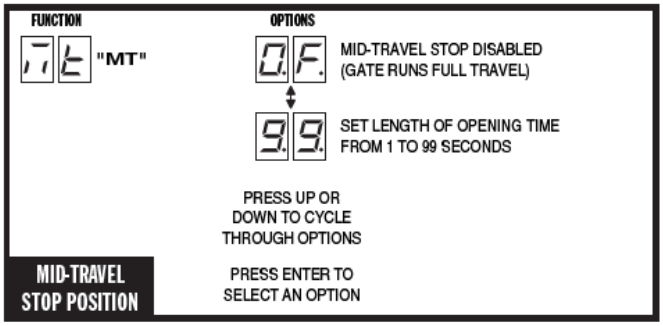
Mid-travel Stop Position

The Controller can be programmed so the gate will stop at a mid-travel point instead of fully opening. This can be useful in installations where a large gate, that takes a long time to open and close fully, only needs to be opened partway to allow traffic to pass.

The factory default sets the Controller for full open operation. Alternately, the Controller can be programmed to open for 1 to 99 seconds then stop, before reaching the open limit.

When a Mid-travel Stop Position time has been programmed, the gate will **still fully open** if the Fire Department input is triggered, if the **OPEN** button is held down beyond the Mid-travel Stop Position, or a close obstruction or reverse loop input is triggered.

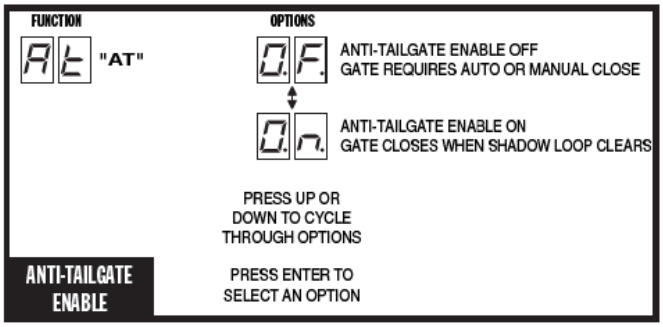
✓ ***NOTE:*** *The Mid-travel Stop feature is disabled when dual gate operation is enabled for paired units.*



Anti-tailgate Enable

The factory default sets the Anti-tailgate Enable to OFF. With this setting, during a gate cycle, after the shadow loop has been triggered by the vehicle and then has cleared after the vehicle passes, the Auto Close Timer or a CLOSE command is required to begin closing the gate.

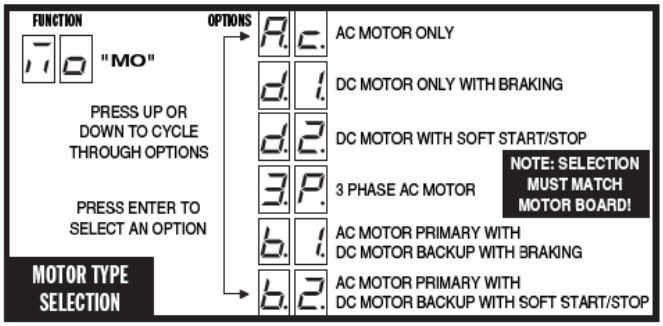
If the Anti-tailgate Enable is set to ON, the gate will close immediately as soon as the shadow loop has cleared. Any subsequent shadow loop triggers while the gate is closing will stop the gate. When the shadow loop clears, the gate will continue closing.



Motor Type Selection

The factory sets the default for the Controller to match the type of motor in the operator. If required, change the motor selection option to a different type of motor used in the operator. The options available are:

- AC Motor Only
- DC Motor Only with Mechanical Braking
- DC Motor with Electronic Soft Start/Stop
- 3 Phase AC Motor
- AC Motor with DC Motor Backup with Mechanical Braking
- AC Motor with DC Motor Backup with Electronic Soft Start/Stop



Advanced Controller Programming (Cont.)

Radio Enable

The Controller contains a built-in MegaCode® radio receiver to allow activation from up to 40 access control transmitters and two Model MGT (gate edge) transmitters. The factory default enables the internal radio receiver. Alternately, the internal receiver can be disabled.

Antenna Installation

The Controller is supplied with a local whip antenna installed. If using a remote antenna, remove the whip antenna and connect coax cable from the antenna to the **ANTENNA** connector.

Radio Transmitter Learn

The Controller's built-in MegaCode® radio receiver can store the IDs of up to 40 transmitters. Refer to the figure for the steps required to learn transmitters.

✓ ***NOTE:*** *This function will NOT be displayed if the transmitter memory is full, or if the radio receiver is disabled.*

Radio Transmitter Delete

Transmitters can be deleted from the Controller's memory either individually, or all at the same time. Refer to the figure for the steps required to delete transmitters.

✓ ***NOTE:*** *This function will NOT be displayed if no transmitters are stored in memory, or if the radio receiver is disabled.*

MGT Obstacle Transmitter Learn

The Controller supports one or two Model MGT Obstacle Transmitters. The transmitters can be programmed to function as Open Obstruction, Close Obstruction, Reverse, or Stop. Refer to the figure for the steps required to learn MGT transmitters.

✓ ***NOTE:*** *This function will NOT be displayed if two MGT transmitters are already stored in memory, or if the radio receiver is disabled.*

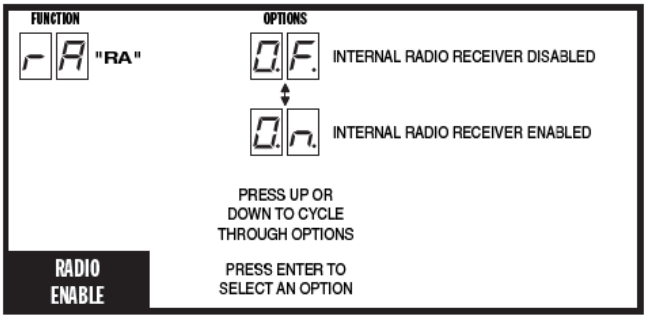
MGT Obstacle Transmitter Delete

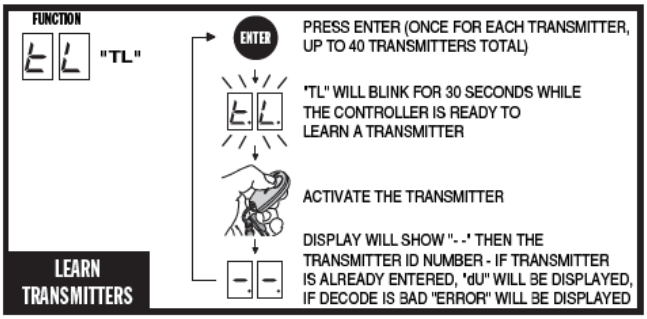
MGT transmitters can be deleted from the Controller's memory either individually, or all at the same time. Refer to the figure for the steps required to delete MGT transmitters.

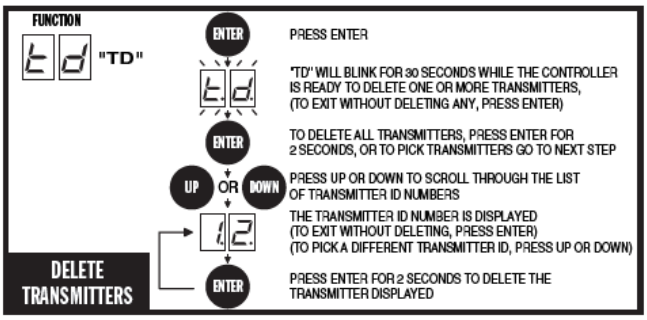
✓ ***NOTE:*** *This function will NOT be displayed if no MGT transmitters are stored in memory, or if the radio receiver is disabled.*

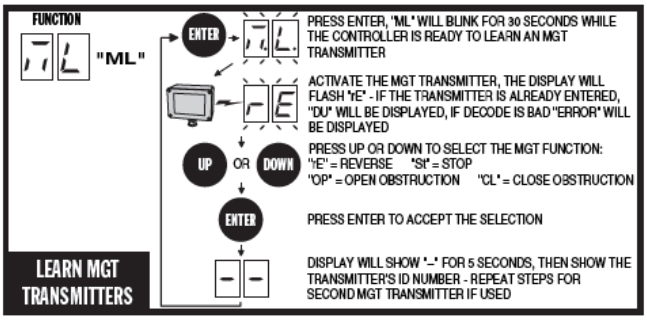
Reset Controller to Factory Defaults

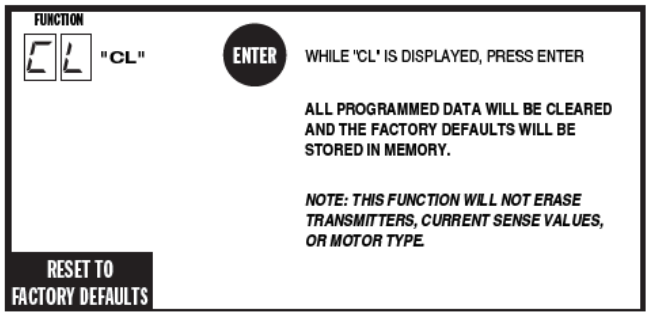
The Controller can be reset with this function. **ALL PROGRAMMED DATA WILL BE LOST**, and the factory defaults will be loaded. This function will not erase radio transmitters, current sense values, or motor type. Transmitters must be deleted with the two functions above.

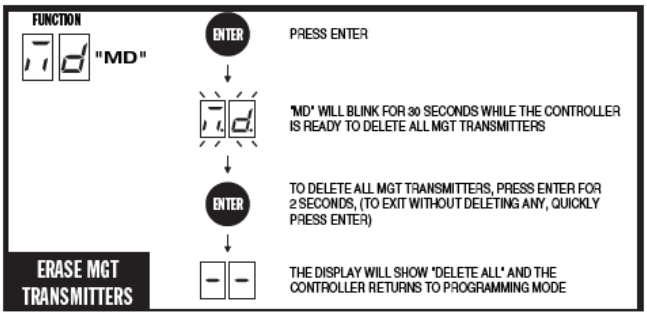












Dual Gate Installations

Two operators can be used in dual gate installations. The operators communicate with each other through the 3-wire **COMM LINK** terminals.

When one operator activates, the **COMM LINK** connection signals the other operator to activate. Each operator functions independently, controlling its gate and monitoring its inputs and accessories.

A three-wire shielded conductor cable is required to connect two operators together for dual operation. Use Belden 8760 Twisted Pair Shielded Cable (or equivalent) only – P/N 2500-1982, per foot).

✓ ***NOTE:*** *The shield wire should be connected COMM LINK terminal "C" in both operators.*

Three of the programming functions available are only used for dual gate installations:

- **Dual Gate Enable**
  Dual Gate Enable must be set for all dual gate installations.
- **Stagger Mode**
  The Stagger Mode function determines if the operator has a delayed open or a delayed close. In dual swing gate installations, typically one operator is programmed for delayed open, and the other operator is programmed for delayed close.
- **Stagger Delay Time**
  The Stagger Time sets the length of the delay for the Stagger Mode.

See Pages 12, 14, & 15 for details on these three dual gate programming functions.

Set the following parameters in each gate operator individually in a single gate mode before connecting the network cable and operating in dual gate mode.

1. Open and Close Limit settings
2. Open and Closed direction inherent entrapment protection (OC & CC)

After these parameters have been set, and each operator has been tested independently and is functioning correctly in single gate mode, then set BOTH operators to dual gate (dg) in the Paired Mode setup step under Basic Programming steps.

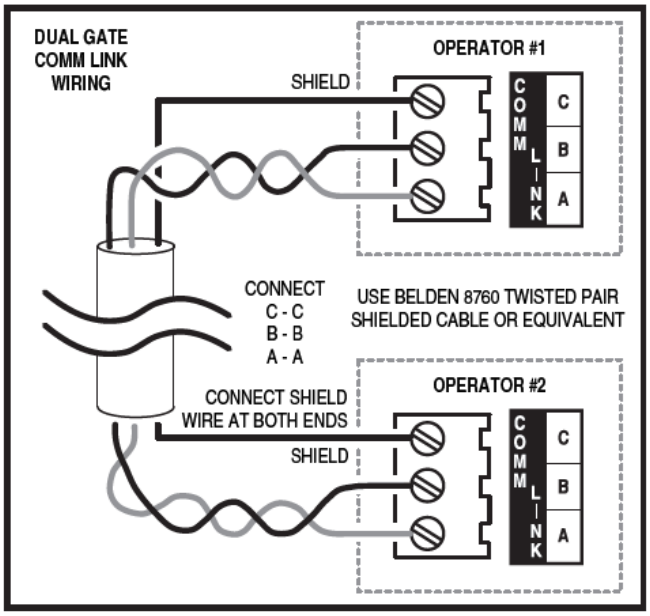


Figure 14. COMM LINK Wiring

Gate Operation

Open Button

Opens the gate. If the Controller is programmed to stop opening the gate at mid-travel, a constant press of the **OPEN** button will override the Mid-travel Stop and completely open the gate. If the Auto Close Timer is set, it will be suspended until the **OPEN** button is released.

Close Button

Closes the gate if the gate is open. Also closes the gate if the gate is in the process of opening.

Stop Button

Stops the gate from opening or closing at any time.

Single Input

Opens the gate if it's closed and closes the gate if it's open (open-close programming option). Activating the input while the gate is moving will reverse the gate.

Can be programmed to stop the gate while the gate is moving (open-stop-close programming option).

Fire Department Input

Fully opens the gate when the input is activated. Overrides the Mid-travel Stop and Auto Close Timer (if either is programmed for the gate). The gate will lockout in the open position without sounding the alarm. Press the **STOP** button to release the lockout.

Open Input

Functions the same as the **OPEN** button.

Open Obstruction

While the gate is opening, any open obstruction signal will cause the gate to stop, reverse a short distance, and then stop again. The Auto Close Timer will be disabled, and a renewed input will be required to start the gate again. Should the gate be restarted and the obstacle signal occur again prior to reaching a limit, the gate will stop again, lockout, and sound the emergency alarm.

Close Obstruction

While the gate is closing, any close obstruction signal will cause the gate to stop, reverse, and travel to the full open position. Should a open obstruction input or an open direction inherent entrapment condition occur prior to the gate reaching the open limit, the operator will lockout and sound the continuous tone alarm. Another close request will be required to start the operator again. If after restart, the overload or a close obstacle happens again before the close limit is reached, the operator will lockout and sound the alarm. If the auto close timer is set, when the close obstruction input is cleared, the gate will close when the auto close timer expires.

Reverse Input

If the reverse input is triggered while the gate is closing, the gate will reverse to the full open position. If the Auto Close Timer is set, when the reverse input is cleared, the gate will close when the Auto Close Timer expires.

Open Loop

Functions the same as the **OPEN** button.

Reverse Loop

Functions the same as the reverse input.

Shadow/Reset Loop

Holds the gate fully open or fully closed while triggered. If open, the gate closes immediately when cleared if Anti-tailgate is enabled.

Operation Indications

During normal operation, the Controller's displays will indicate current operating conditions and status.

Power-up Display

When the Controller powers up, dashes will show on the display, then the firmware version number, then the gate type (SL for slide and swing gates).

Exiting programming restarts the Controller. The power-up display will show upon the restart.

Idle Condition

While the Controller is idling, waiting for a command, the display will show circulating dashes.

For DC models only - Clockwise : Batteries discharging,
Counterclockwise : Batteries charging.

Last Gate Position/Condition

When the gate moves or stops, the display will show the status for up to one minute.

- Stop is displayed as St
- Full Close is displayed as FC
- Full Open is displayed as FO
- Entrapment is displayed as En

Pre-start Delay

During the pre-start delay, the display will countdown the number of seconds remaining before the operator starts.

Reverse Delay

If the gate travel direction is reversed from a user activation or reversing device, and a reverse delay is set, the display will count down the delay time in seconds before the operator restarts.

Run Timer

While the gate is opening or closing, the number of seconds running time is displayed.

Error Indications

During abnormal operation, the Controller's displays and beeper will indicate the error condition that has occurred.

Entrapment

If an entrapment condition occurs detected by two repeated open or close obstruction triggers, the Controller will lock the operator out. The beeper will sound constantly and the gate will not operate. To reset the Controller press the **STOP** button or press the **RESET** button on the operator's cover.

⚠ WARNING ⚠

The Stop and/or Reset button must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.

COMM LINK Connection Failure

In dual gate installations, if there is a connection failure between the two operators, the **COMM LINK** indicator will blink once a second. During this condition the gate will not operate, except if triggered by the **FIRE DEPT** input, which functions normally.

MGT Obstacle Transmitter Trouble

If any MGT transmitters are used with the operator, their supervision feature will alert the Controller if there is any trouble with the transmitter. MGT transmitters send hourly status reports and will send low battery reports when the transmitter has a low battery. The MGT transmitters also have a tamper detection switch that will trigger when their case is opened.

When the Controller detects a low transmitter battery, a tamper signal, or missing transmitter status reports, the gate will still operate normally, but the beeper will change as follows:

- The Pre-start Alarm will beep twice as fast.
- The Run Alarm will beep twice as fast and continue for five minutes after the gate stops.
- The sounder will "chirp" every five seconds when the gate is idle.

Correct the trouble (close case, replace battery, or replace transmitter) to clear the obstacle transmitter trouble indications.

Maximum Run Time Exceeded

If the Maximum Run Time is exceeded, the Controller stops the operator the same as if a double obstacle has occurred in an entrapment condition. The entrapment alarm sounds constantly, and is cleared by pressing the **STOP** button or the **RESET** button on the cover. After the **STOP** or **RESET** button is pressed, because the Maximum Run Time has been exceeded, the sounder will beep twice every five seconds. The next operation of the gate will clear the indication.

CONTROLLER ERROR CAUSES AND INDICATIONS

ERROR CAUSE	ERROR INDICATION	HOW TO CLEAR
TWO SAFETY REVERSALS (ON SINGLE GATE OR ON EITHER DUAL GATE)	En 00, CONTINUOUS ALARM BEEPER, GATE DISABLED	PRESS STOP BUTTON
MAXIMUM RUN TIMER EXCEEDED ON OPENING	En 01, AND **MAX RUN** LED, CONTINUOUS ALARM BEEPER, GATE DISABLED	PRESS STOP BUTTON, CLEARS CONTINUOUS ALARM, THEN DOUBLE BEEP EVERY 5 SECONDS UNTIL NEXT OPERATION
MAXIMUM RUN TIMER EXCEEDED ON CLOSING	En 02, AND **MAX RUN** LED, CONTINUOUS ALARM BEEPER, GATE DISABLED	PRESS STOP BUTTON, CLEARS CONTINUOUS ALARM, THEN DOUBLE BEEP EVERY 5 SECONDS UNTIL NEXT OPERATION
COMM LINK FAILURE	En 03, AND **COMM LINK** LED, CONTINUOUS ALARM BEEPER FOR 1 MINUTE, GATE DISABLED (EXCEPT FOR FIRE DEPT INPUT)	PRESS STOP BUTTON, CLEARS CONTINUOUS ALARM
GATE FULL OPEN RESULTING FROM FIRE DEPT INPUT	En 04, GATE DISABLED	PRESS STOP BUTTON
FAIL SAFE OR FAIL SECURE BECAUSE OF BATTERY VOLTAGE DROP BELOW 21.6 VDC DUE TO AC POWER LOSS	En 05, GATE DISABLED	BATTERY VOLTAGE MUST RISE ABOVE 24 VDC
OTHER CONTROLLER IN ENTRAPMENT (DUAL GATE)	En 06, GATE DISABLED	CLEAR ENTRAPMENT ON OTHER CONTROLLER (PRESS STOP)
LOW AC VOLTAGE AT CONTROLLER	En 07, GATE DISABLED	RESTORE AC POWER TO NORMAL LEVEL
INPUT TRIGGERED DURING ENTRAPMENT LOCKOUT	En 08, GATE DISABLED	PRESS STOP BUTTON
COMPATIBILITY PROBLEM	En 09, GATE DISABLED	UPDATE FIRMWARE AND RESET BOTH PAIRED CONTROLLERS
EEPROM PROBLEM	En 10, GATE DISABLED	TRY RESET, CALL TECH. SUPPORT
DC MOTOR MISMATCH	En 11, GATE DISABLED	REPROGRAM MOTOR TYPE OR CHANGE DC MOTOR BOARD, NEXT GATE MOVEMENT WILL RETRY DC MOTOR CHECK
MOTOR FAILURE	En 12, GATE DISABLED	CALL TECH. SUPPORT
AC POWER LOSS IN OPEN OR CLOSE IMMEDIATE POWER FAIL MODE	En 13	REAPPLY AC POWER
MAXIMUM RUN TIMER EXCEEDED AFTER AC POWER LOSS	En 14	BATTERY VOLTAGE MUST RISE ABOVE 24 VOLTS
MGT SUPERVISORY CONDITION (TAMPER, LOW BATTERY, MISSING HOURLY STATUS)	FAST BEEPS DURING PRESTART, FAST BEEP RUN ALARM, CHIRP EVERY 5 SECONDS AT IDLE	CLEARS WHEN MGT CONDITION CLEARS

Troubleshooting

Contacting Technical Support

For technical questions regarding Linear gate operators, contact the Technical Services Department at:

1-800-421-1587 from 6:30 AM to 4:30 PM Pacific time

Operator fails to start

A. If the operator has been running a large number of cycles, the motor may have become too hot and tripped its thermal overload breaker. Allow the motor to cool down and the thermal overload breaker will reset automatically.

B. Make sure you have power at the master distribution panel and that the power has not been turned off.

C. On an SWD, if the "Reset to Factory Defaults" programming step has been used, ensure the motor type (MO) has been set to d2 and the open (OC) and close (CC) currents have been reset.

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 the setscrews in limit cams for tightness. Replace if necessary.

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

A. The Controller 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 the beeper will sound.

C. An obstruction signal from an accessory wired to the obstruction input may have triggered falsely. Check the control board for lit indicators for any of the following inputs: safety, shadow/reset, 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 9 for details on the control board indicators.

Gate staying open with automatic system

A. If there are vehicle detectors used with the operator, one of the loops or loop detectors may be sending a false signal or needs to be reset. Observe the indicators on the loop detector. Unplug the detector 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

NOTE: Refer back to Section B.10 Electrical Installation Guide