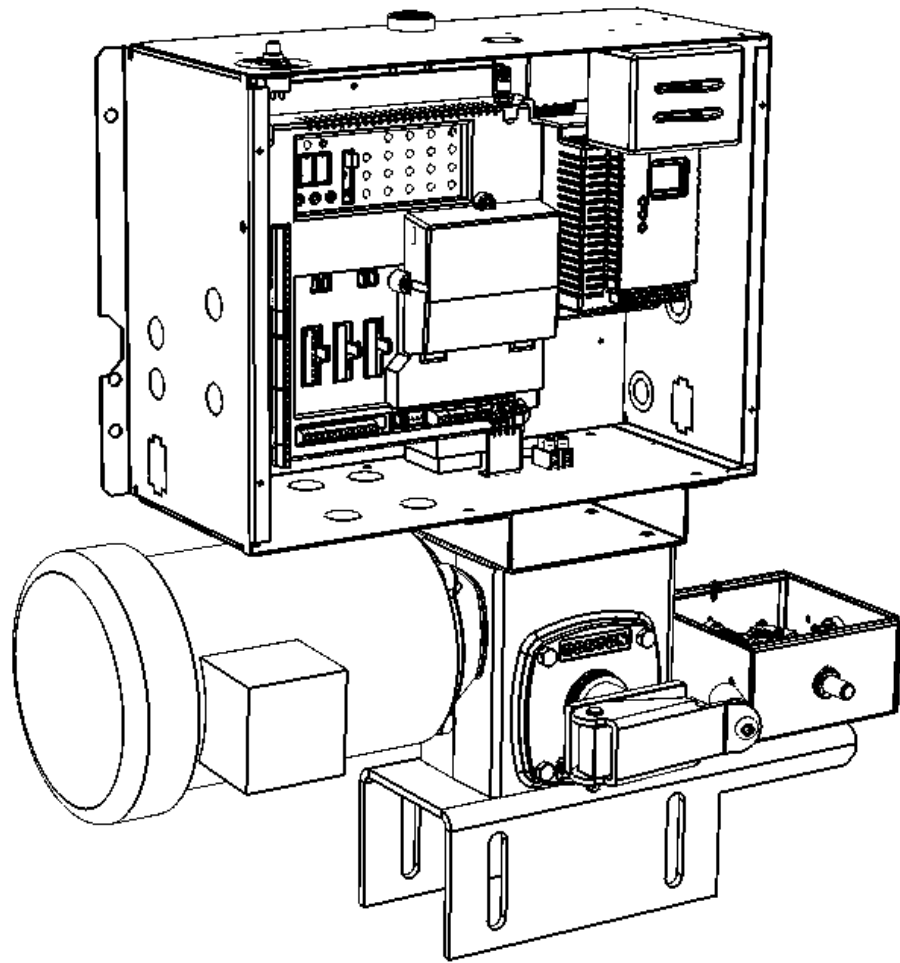


# TYM-VSA

## Vari-Speed Gate Operator Installation & Owner's Manual



Operator models contained in this manual  
conform to UL325 standard for use in  
Class III and IV applications

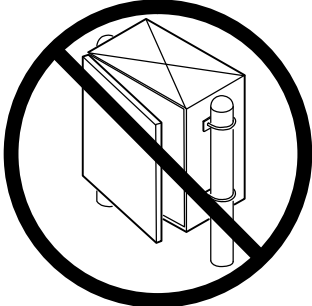



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**WARNING**




ONLY QUALIFIED TECHNICIANS SHOULD WORK ON TYMETAL SLIDE GATE OPERATORS

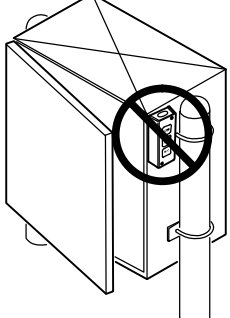
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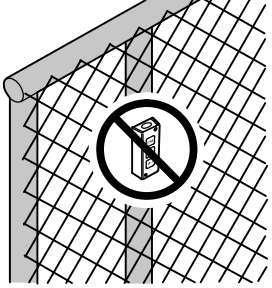


**WARNING**



CONTROLS INTENDED FOR USER ACTIVATION MUST BE LOCATED AT LEAST SIX FEET (6') AWAY FROM ANY MOVING PART OF THE GATE AND WHERE THE USER IS PREVENTED FROM REACHING OVER, UNDER, AROUND OR THROUGH THE GATE TO OPERATE THE CONTROLS. OUTDOOR OR EASILY ACCESSIBLE CONTROLS SHALL HAVE A SECURITY FEATURE TO PREVENT UNAUTHORIZED USE.





## Pre-installation Information

### Before You Begin...

Before unpacking, inspect the carton for exterior damage. If you find damage, advise the delivery carrier of a potential claim. Inspect your package carefully. You can check your accessory box parts with the enclosed packing slip for your convenience. Claims for shortages will be honored for only 30 days from the date of shipment.

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

If you have any questions about the requirements for proper installation of this gate operator contact technical support at 800-328-4283.

### Always Check the Gate's Action

**It's very important before installing the gate operator to make sure the gate slide is free and level throughout the entire opening distance. If the gate does not seem to operate properly, it may affect the operator performance or greatly shorten the life of the unit.**

### Gate Operator Classifications

All gate operators can be divided into one of four different classifications, depending on their design and usage. Install this gate operator only when the operator is appropriate for the construction and usage class as defined below:

- **Class I Residential Vehicular Gate Operator**  
A vehicular gate operator intended for use in a home or for one to four single family dwellings with a common garage or parking area associated with these dwellings.
- **Class II Commercial / General Access Vehicular Gate Operator**  
A vehicular gate operator intended for use in a commercial location or building such as a multi-family housing unit of five or more single family units, hotel, retail store or other building servicing the general public.
- **Class III Industrial / Limited Access Vehicular Gate Operator**  
A vehicular gate operator intended for use in an industrial location or building such as a factory or loading dock area or other location not intended to service the general public.
- **Class IV Restricted Access Vehicular Gate Operator**  
A vehicular gate operator 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.

### Approved Entrapment Protection Devices

The following entrapment protection devices have been approved for use with this gate operator as part of a UL325 compliant installation. Contact customer service for additional options.

#### Non-Contact Devices

620-101251 Thru Beam Photoeye IRB-MON

#### Contact Devices

620-101260 Edge Sensor MGO-20 w/MON, 5FT

620-101268 Edge Sensor MGR-20 w/MON, 5FT

#### Monitored Radio

620-101256 Edge Radio MGL-K20 w/MON

620-101305 Edge Radio Transmitter Only w/MON

## Safety Information and Warnings

THE FOLLOWING FORMATS ARE USED FOR SAFETY NOTES IN THESE INSTRUCTIONS.

### ⚠ CAUTION ⚠

This type of warning note is used to indicate the possibility of damage to the gate or gate operator.

### ⚠ WARNING ⚠

This type of warning note is used to indicate possible mechanical hazards that may cause serious injuries or death.

### ⚡ WARNING ⚡

This type of warning note is used to indicate possible electrical shock hazards that may cause serious injuries or death.

### Regulatory Warnings

Read the following before beginning to install this slide gate operator:

### IMPORTANT INSTALLATION SAFETY INSTRUCTIONS

### ⚠ WARNING ⚠

### TO REDUCE THE RISK OF SEVERE INJURY OR DEATH TO PERSONS, REVIEW THESE INSTALLATION SAFETY STEPS BEFORE PROCEEDING

1. READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.
2. Read the yellow "Safety Instructions" brochure enclosed with the packet of information. If any pages are missing or are unreadable, or you do not have the safety instructions, please call Tymetal at 1-800-328-4283 to request additional copies.
3. ALL ELECTRICAL CONNECTIONS TO THE POWER SUPPLY MUST BE MADE BY A LICENSED ELECTRICIAN AND MUST OBSERVE ALL NATIONAL AND LOCAL ELECTRICAL CODES.
4. A separate power-disconnect switch should be located near the operator so that primary power can be turned off when necessary.
5. Install the enclosed warning signs on both sides of the gate. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
6. Never reach between, through or around the fence to operate the gate.
7. Never connect a button station within reach of the gate or on the side of the gate operator.
8. Do not adjust the operator controller's current sensing feature too high. It should be adjusted high enough to keep the gate from falsely triggering the sensing, but no higher than necessary for the gate to operate. DO NOT DEFEAT THE PURPOSE OF THIS FUNCTION!
9. You must install all required safety equipment.
10. UL325 Compliance requires the use of contact edges or photoelectric controls on all automatic or remotely-controlled gate operators.
11. The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come into contact with the vehicular gate during the entire path of travel of the vehicular gate.

# Wiring Specifications

Refer to the following steps for details on power and accessory wiring for the operator.

**⚡ WARNING ⚡**

**ALL AC ELECTRICAL CONNECTIONS TO THE POWER SOURCE AND THE OPERATOR MUST BE MADE BY A LICENSED ELECTRICIAN AND MUST OBSERVE ALL NATIONAL AND LOCAL ELECTRICAL CODES.**

## USE COPPER WIRE ONLY!

### AC Power Wiring

1. Find the listing on this page corresponding to the model, voltage horsepower, and amperage rating of your operator.
2. The distance shown in the table is measured in feet from the operator to the power source. **DO NOT EXCEED THE MAXIMUM DISTANCE.** These calculations have been based on standard 230 V supplies with a 10% drop allowable. If your supply is under the standard rating, the runs listed may be longer than what your application will handle, and you should not run wire too near the maximum distance for the gauge of wire you are using.
3. When large-gauge wire is used, a separate junction box (not supplied) may be needed for the operator power connection.
4. Wire length calculations are based on the National Electrical Code, Article 430 and have been carefully determined based on motor inrush, brake solenoids, and operator requirements.
5. Connect power in accordance with local codes. **The green ground wire must be properly connected.**
6. Wire insulation must be suitable to the application.
7. **LOCAL EARTH GROUND REQUIRED** (See Figure 1 and Page 5).

### DC Control and Accessory Wiring

1. Choose an accessory device that is compatible with 24 VDC supply power available at APeX controller (DC+, DC-), 0.75 amps max.
2. Gate control devices (push button, keypad, card reader, etc.) use "dry contacts" handling 5VDC (from open, close, stop, and common terminals). APeX controller provides 5 VDC supply for OPEN-CLOSE-STOP that is operational for up to 2500 ft with 20 ga. stranded wire and up to 5000 ft with 18 ga. stranded wire. In any case, wire should be properly sized as per NEC standards. Long Distance Module is not required.
3. Control wiring must be run in a separate conduit from power wiring. Running them together may cause interference and faulty signals in some accessories.
4. A three-wire shielded conductor cable is required to connect two operators together for dual operation. You must use Belden 8760 Twisted Pair Shielded Cable (or equivalent) only – P/N 2500-1982, per foot). See Page 24 for details of this connection. **Note: The shield wire should be connected in both the operators.**

SINGLE PHASE POWER WIRING			
VOLTS, HP & AMPERAGE	MAXIMUM DISTANCE (FEET)		WIRE GAUGE
	SINGLE	DUAL	
208 VOLTS 1-HP, 10A	544	272	12
	864	432	10
	1374	686	8
	2184	1092	6
	3476	1738	4
208 VOLTS 2-HP, 16A	272	136	12
	432	216	10
	687	343	8
	1092	546	6
	1738	869	4
230 VOLTS 1-HP, 10A	640	320	12
	1016	508	10
	1616	808	8
	2570	1285	6
	4090	2045	4
230 VOLTS 2-HP, 16A	320	160	12
	508	254	10
	808	404	8
	1285	642	6
	2045	1022	4

THREE PHASE POWER WIRING			
VOLTS, HP & AMPERAGE	MAXIMUM DISTANCE (FEET)		WIRE GAUGE
	SINGLE	DUAL	
208 VOLTS 1-HP, 6A	714	357	12
	1136	568	10
	1804	902	8
208 VOLTS 2-HP, 9A	357	178	12
	568	284	10
	902	451	8
230 VOLTS 1-HP, 6A	840	420	12
	1336	668	10
	2124	1062	8
230 VOLTS 2-HP, 9A	420	210	12
	668	334	10
	1062	531	8
460 VOLTS 1-HP, 3A	2689	1345	12
	4274	2437	10
	6798	3399	8
460 VOLTS 2-HP, 6A	1345	672	12
	2437	1218	10
	3399	1699	8

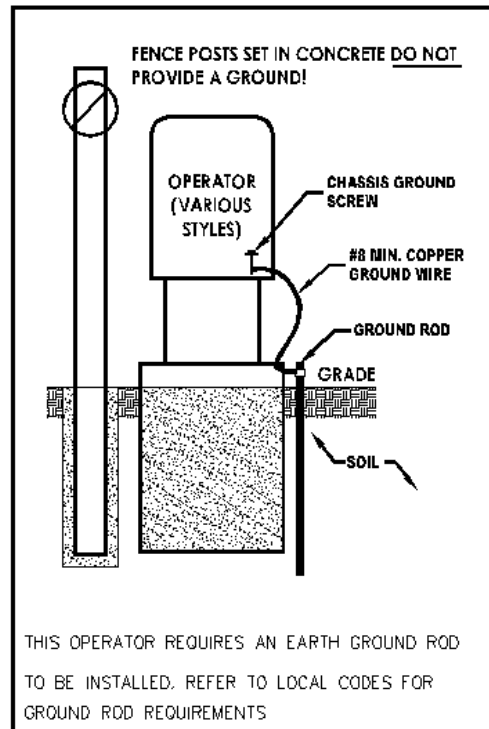
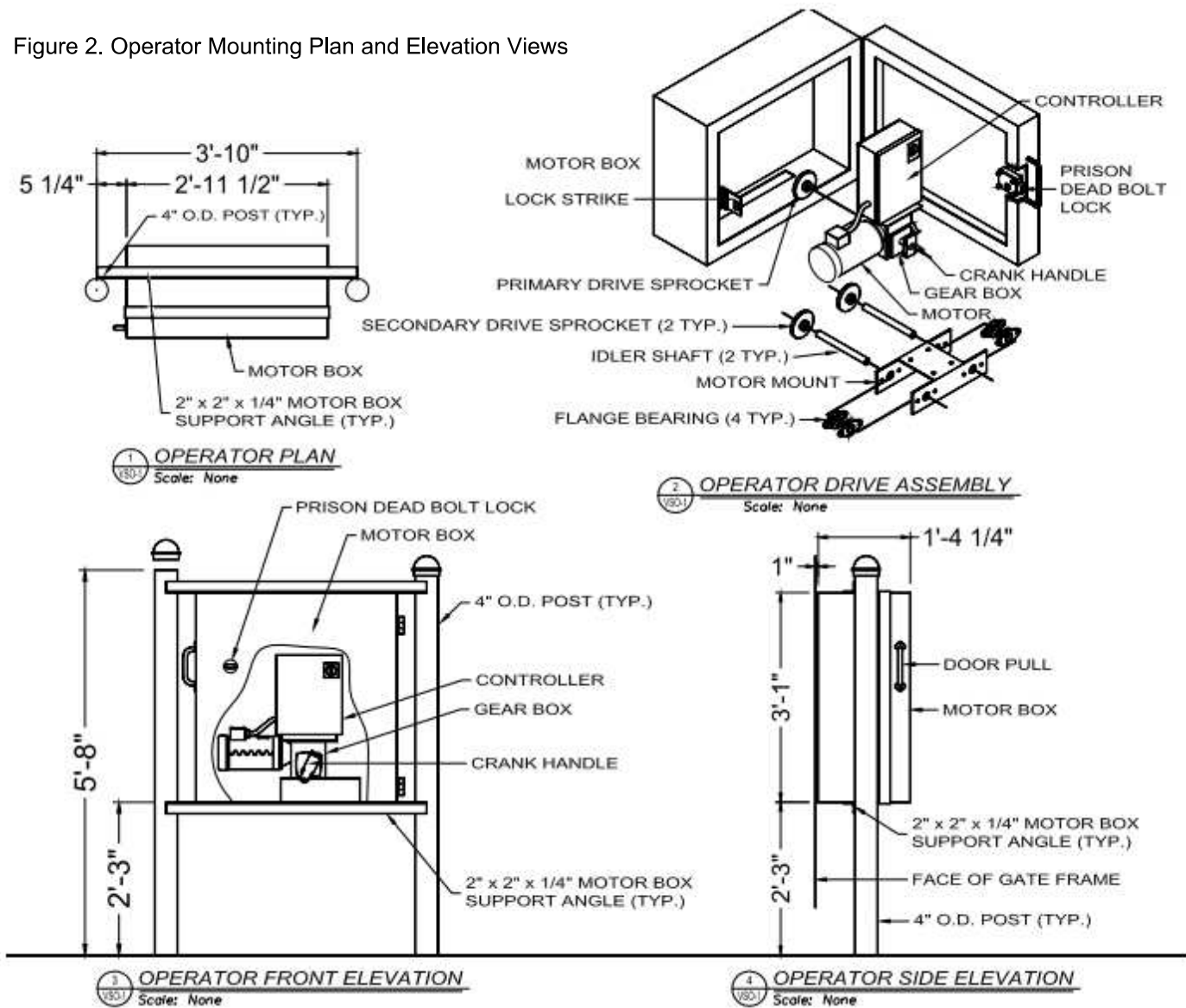


Figure 1. Earth Ground

# Installing The Operator

Figure 2. Operator Mounting Plan and Elevation Views



The following instructions are applicable for standard mounting on a double post set of the TYM-VSA gate operator (refer to the operator installation drawing of Figures 2 above and 6 below. After completing the gate installation, place the operator mounting posts at the appropriate location as shown on Figure 2 above. A local engineer in accordance with local building codes shall determine the post footing requirements. When the concrete had set sufficiently, install the lower motor box support angle. The angle should be set level and welded to the motor box posts so the top of the angle is at 27" above grade.

The chain mounting brackets provided with the operator should be mounted on the gate frame at each end with the centerline of the slots 25" above grade. You will require an electric drill with a 3/8" bit for attaching the chain brackets to the gate. See figures 3, 4, 5 and 5a below. From the center of the slot in the bracket, run a string line taut from one chain mounting bracket to the other. Place the operator on the installed motor box

support angle and position the unit so that the string is centered on the slot in the bottom of the motor box, centered between the support posts, and parallel with the gate frame as shown in Figure 6. Tack weld the upper support angle to the support posts. Align the slot in the bottom of the operator with the string; check for plumb and parallel and tack the operator the mounting angles.

Open the motor box door and unfold the crank handle on the drive unit. Attach one end of the chain to the gate and feed the chain under the idler sprockets and over the drive sprocket. Attach the free end of the chain to the bracket on the opposite end of the gate and tension the chain. Attach the chain support brackets to the appropriate gate vertical members to prevent sagging of the chain. Using the hand crank, cycle the gate fully open and closed to verify proper alignment. Make any adjustments necessary. Complete the installation by welding the upper guide angle to the mounting posts and the operator the mounting angles.

Where vehicles will pass in close vicinity of the operator, consider installation of bollards in front of the operator to protect the operator from damage.

# Gate Bracket and Chain Assembly

❑ **NOTE:** The item numbers shown in these illustrations are for reference only. For the actual part numbers, refer to the parts lists in the rear of this manual.

Your gate should be hung level and move freely by hand in both directions before attaching the operator drive chain.

Slide the gate to the fully open position. Line up the slot in the chain mounting bracket with the bottom of the idler wheel on the operator. Mark the leading edge of the gate frame using the chain mounting bracket as a template. Drill and mount the chain mounting bracket as shown in figure 3.

Slide the gate to the fully closed position and mount the other chain mounting bracket to the rear edge of the gate frame in the same way.

Attach the chain to both chain mounting brackets as shown in figure 4, then route the chain through the operator as shown in figure 4a.

Install chain support brackets as shown in figure 5 and 5a. Brackets should support the chain but must not hit the operator. See figure 2. Adjust the chain to have 1-2" of sag between the chain supports, as shown in Figure 6.

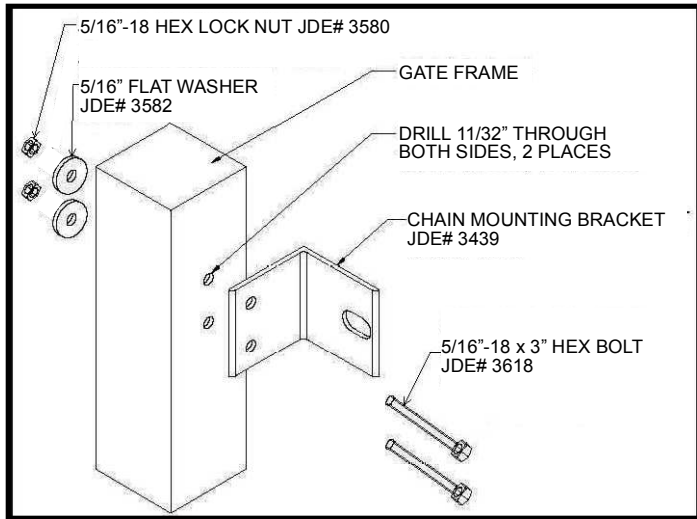


Figure 3. Mounting Gate Bracket to Gate

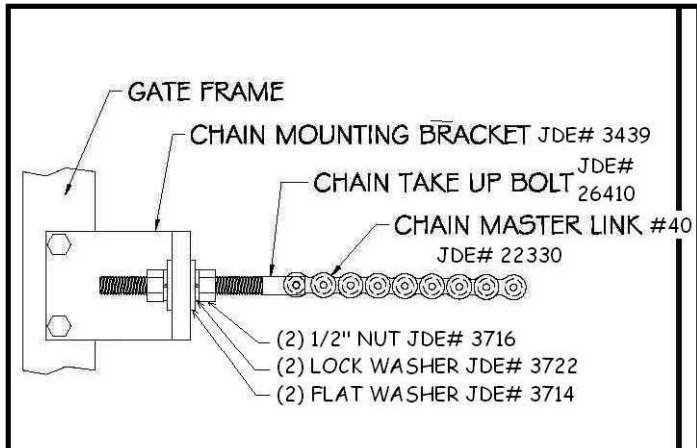


Figure 4. Chain to Bracket Assembly

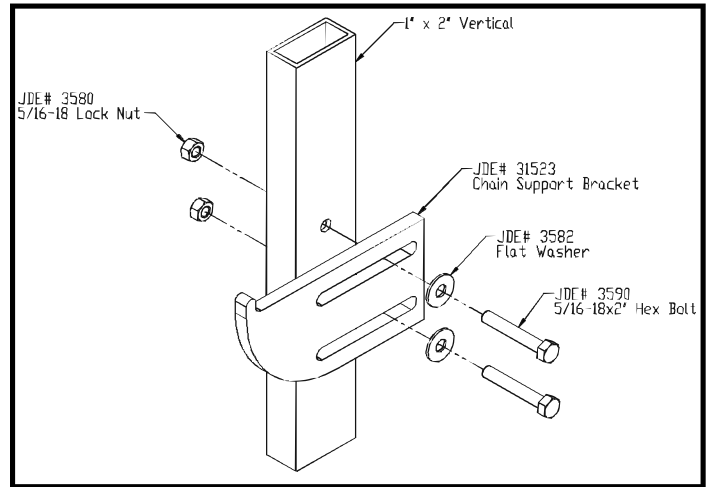


Figure 5. Standard

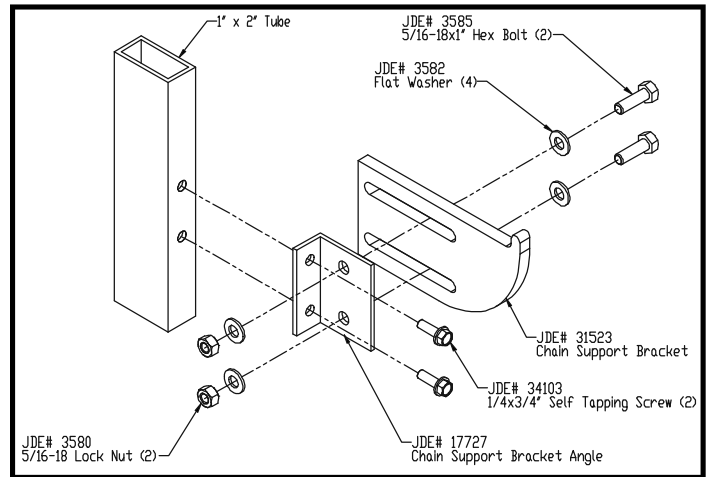
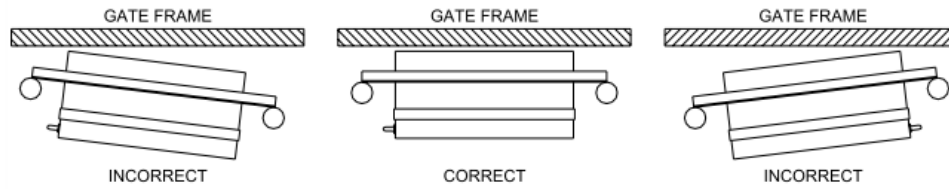
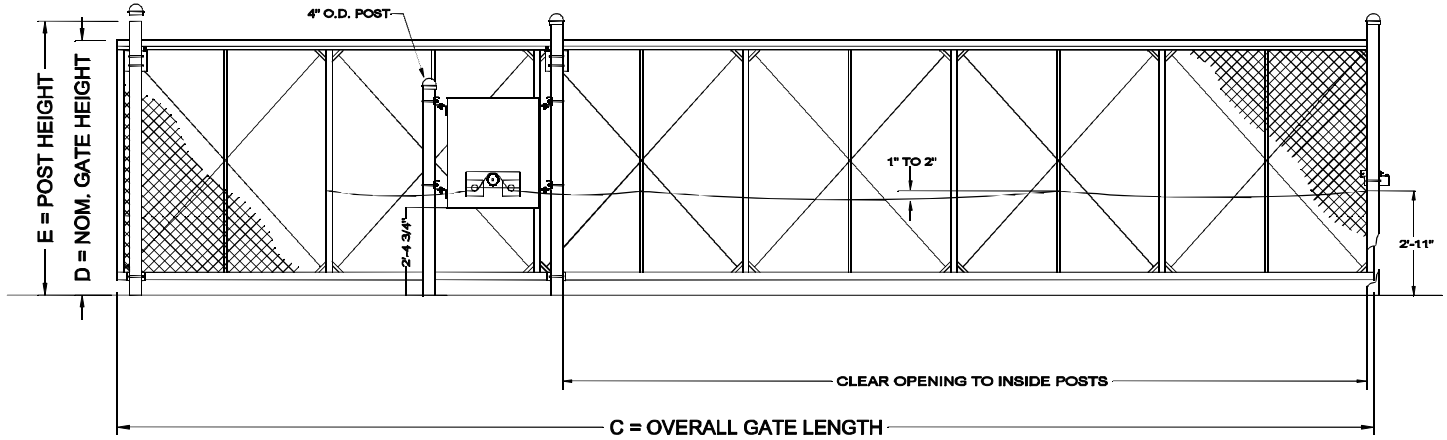


Figure 5a. Ornamental



Parallel Placement of Operator with Chain Parallel to Gate



See Submittal Drawing for Gate and Chain Configuration

Figure 6. Operator Placement

## Operator Setup

### AC Power Connection

All Tymetal gate operators are supplied with a power disconnect switch to turn on and off the power available to the operator. Following wiring specifications on Page 2, incoming power should be brought into the operator and connected to the labeled pigtails from the disconnect box.

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

**⚠ WARNING ⚠**

**ALL AC ELECTRICAL CONNECTIONS TO THE POWER SOURCE AND THE OPERATOR MUST BE MADE BY A LICENSED ELECTRICIAN AND MUST OBSERVE ALL NATIONAL AND LOCAL ELECTRICAL CODES**

### Earth Ground

Install a ground rod and connect it to the operator's frame in every gate operator installation. A good earth ground is necessary to allow the Controller's built-in surge and lightning protection circuitry to work effectively. The physical bolting of the operator to the mounting posts **is not** sufficient for a good earth ground. See Figure 1.

**NOTE:** Do not splice the ground wire. Use a single piece of solid copper 12 AWG wire between the ground rod and the operator.

1. Install an 8-foot long copper ground rod next to the operator mounting pad within three feet of the operator.
2. Use a clamp to connect a solid copper 12 AWG ground wire to the ground rod.
3. Route the ground wire to the operator.
4. Connect the ground wire to the operator's frame.

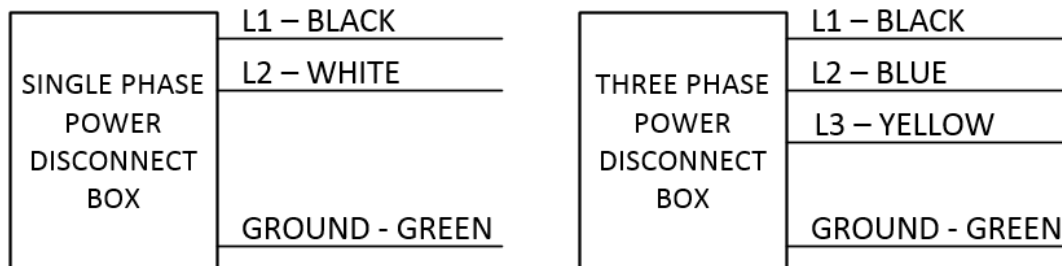


Figure 8 - Power Disconnect Box Wiring

## Operator Setup cntd.

**Clutch Adjustment** - note the clutch assembly is shipped at its minimum pressure setting from the factory. It will have to be tightened prior to engaging the unit for its first run. The determination of the desired clutch pressure/gate resistance is the sole responsibility of the owner/end user. The clutch assembly protects the mechanical components of the gate operator from being damaged.

Check to make sure the clutch handle is disengaged properly. Unfold the crank handle and make sure that the spacer located between the crank handle and conical washers turn freely. If this does not happen correct as follows. Loosen the pressure bolt located at the end of the crank handle (see Figure 9) and using a hammer, gently tap the crank handle away from the gear box until the spacer rotates freely. Tighten the pressure bolt.

Unfold the crank handle. There are two Allen head bolts located on the handle. One bolt has a spring on it, the other has a locking nut. The bolt with the locking nut is the adjustment for the clutch.

Note - adjust the conical washers as shown in Figure 9A for gates under 2500 lbs and 9B for gates over 2500 lbs.

**To TIGHTEN the clutch** - Loosen the locking nut and tighten the adjustment bolt. Retighten the locking nut on the adjustment bolt. Adjust in this manner if the gate does not move when the gear box turns (make sure the clutch handle is engaged). Adjust in this manner until the gate will reliably complete the open and close cycles. When the gate reliably opens and closes any further tightening adjustment will cause the gate to apply more pressure to an obstruction before the clutch will slip.

**To LOOSEN the clutch** - Loosen the locking nut and loosen the adjustment bolt. Retighten the locking nut on the adjustment bolt. Adjust in this manner if the gate reliably opens and closes and is applying excessive pressure to an obstruction before the clutch will slip. Repeat the above adjustment step (as applicable) until the gate will reliably open and close and does not put excessive pressure on an obstruction before the clutch slips.

**MANUAL OPERATION** - The gate can be moved open or close in case of power failure or other need to move the gate manually without disconnecting the operator chain. Remove power from the unit by turning the main disconnect switch to OFF (turn switch off even if the power is out over the local grid). Pull back on the manual crank handle located on the gear reducer. This action disengages the gear box internal clutch mechanism and engages manual operation. Rotate the handle in the clockwise or counter-clockwise direction to move the gate in the direction desired. The amount of force required to move the gate will depend on the gate weight and the inherent friction of the overall system.

**MANUAL OPERATION IS TO BE ATTEMPTED ONLY WHEN THE OPERATOR IS NOT MOVING THE GATE UNDER POWER.**

## Open and Close Limit Adjustment

The limit nuts are **NOT PRESET** at the factory and must be adjusted for the gate in each installation. The limit switches are activated by two threaded nylon rotary limit nuts which are attached to a threaded limit shaft driven by a chain and sprockets from the main drive shaft. **REMOVE THE CARDBOARD FILLER BEFORE ADJUSTING THE LIMIT NUTS.**

The Controller is factory setup for right-hand installations. The **OPEN** limit switches are the ones closer to the front of the operator. In left-hand installations, the **CLOSE** limit switches are the ones closer to the front of the operator (see Figures 10 & 11).

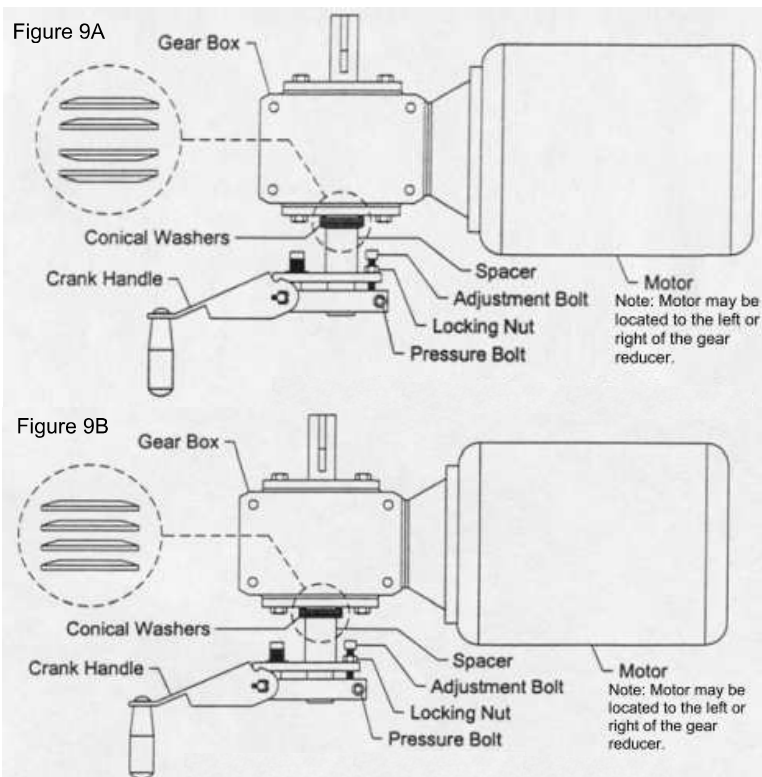
### ⚠ CAUTION ⚠

**If the operator is installed in a left-hand installation. Set the Controller to left-hand operation BEFORE running the operator for the fine setting of the limit cams. Failure to do so will result in over-shooting the limit switches, and may cause damage to the operator and/or gate. Refer to programming on Page 12.**

## Limit Nuts Rough Adjustment

Before running the operator, set the limit nuts as follows:

1. With the gate connected to the gate operator in a mid-travel position, turn the power disconnect switch **OFF**.
2. To adjust the limit nuts, press down on the detent plate and rotate the limit nut along the threaded shaft (see Figure 12).
3. Adjust the **OPEN** limit nut until it is about 1/2" from activating the LSO-2 **OPEN** limit switch.
4. Adjust the **CLOSE** limit nut until it is about 1/2" from activating the LSC-2 **CLOSE** limit switch.





## Operator Setup cntd.

### Limit Nuts Fine Adjustment

After finishing the rough limit nut adjustments, run the operator to set the fine limit adjustment.

1. Turn the power disconnect switch **ON**.
2. Stand clear of any moving parts and press the **OPEN** button.
3. After the gate opens, press the **CLOSE** button.
4. Observe the gate in both directions as it runs through each complete cycle. Adjust the open or close limit nuts again if necessary. Fine levels of adjustment can be made by adjusting a few teeth on the nut at a time. If the gate stops during travel, you may need to adjust the Open or Close Current Setting or the Maximum Run Timer (see Pages 13-14).

### Setting Speeds using LSO-2 & LSC-2

Limit switches LSO-2 and LSC-2 control when the operator accelerates to maximum speed and decelerates to minimum speed. It is recommended that LSO-2 and LSC-2 are adjusted first so the gate slows to near stop before hitting LSO-1 or LSC-1 as these will apply the brake upon activation.

Adjust LSO-2 and LSC-2 by slightly loosening the two screws which hold them in place and sliding toward or away from the center of the limit box. Care must be taken not to adjust too close to the center as the limit nut may travel past the switch and start accelerating at the end of the cycle.

**NOTE: Auxiliary limits are not shown for clarity.**

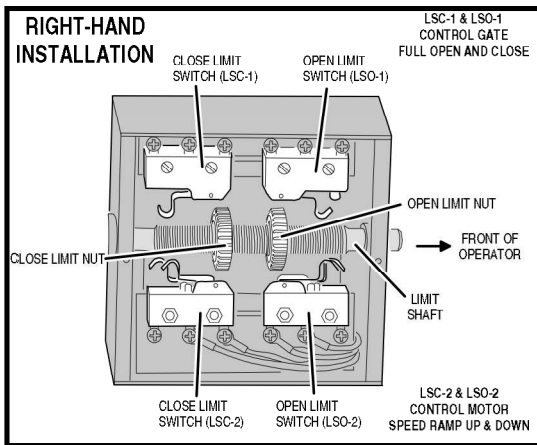


Figure 10. Limit Box Assembly (Right-hand Installation)

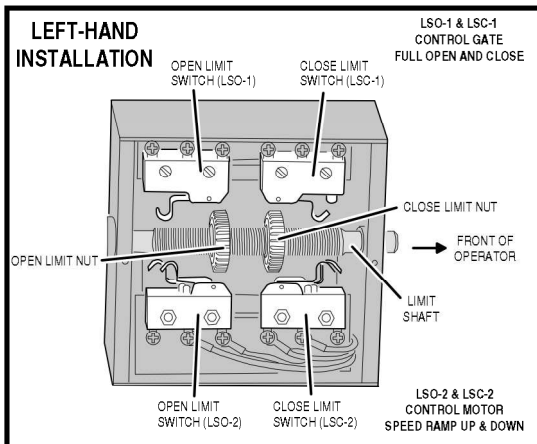


Figure 11. Limit Box Assembly (Left-hand Installation)

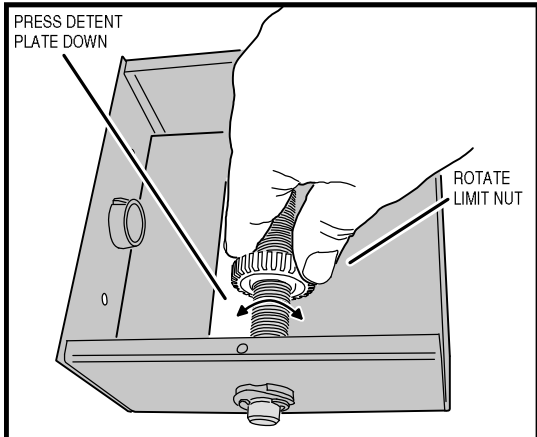


Figure 12. Setting the Limits

# Controller Features

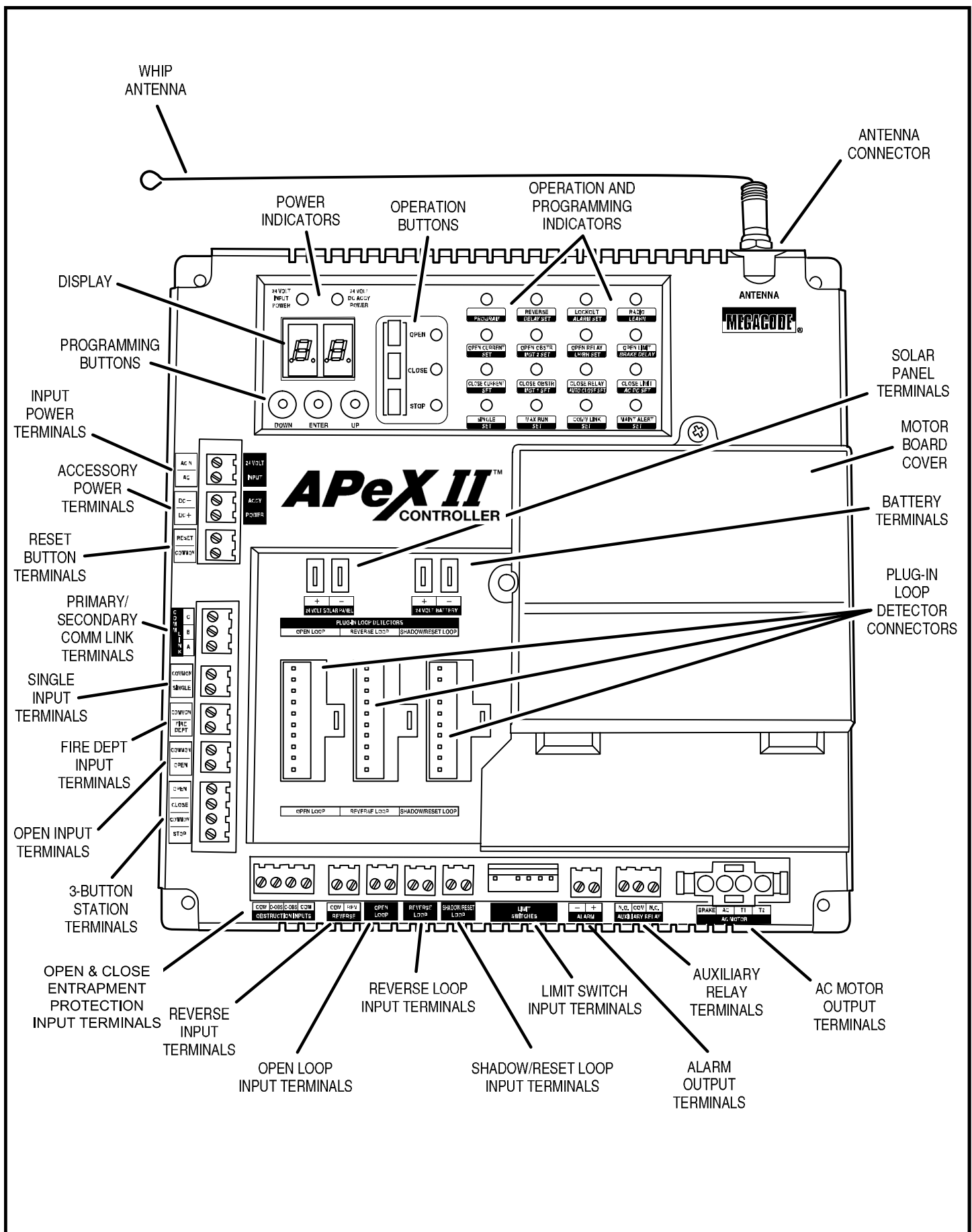


Figure 14. Controller Features

# 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

"RL" LEFT OR RIGHT HAND OPERATION	"RT" MAXIMUM RUN TIMER	"CP" CONSTANT PRESSURE MODE	"TL" LEARN TRANSMITTERS
"PM" SINGLE OR DUAL GATE	"SB" SINGLE BUTTON INPUT SETUP	"SP" SHADOW LOOP OPEN INHIBIT	"TD" DELETE TRANSMITTERS
"AC" AUTO CLOSE TIMER	"SM" STAGGER MODE	"CT" RESET CYCLE COUNT	"ML" LEARN MGT TRANSMITTERS
"RP" RUN ALARM PRE-START ALARM	"ST" STAGGER TIME	"MA" MAINTENANCE ALERT TRIGGER	"MD" ERASE MGT TRANSMITTERS
"OC" MAXIMUM OPEN CURRENT	"AR" AUXILIARY RELAY MODE	"MT" MID-TRAVEL STOP POSITION	"MO" MOTOR TYPE SELECTION
"CC" MAXIMUM CLOSE CURRENT	"RD" REVERSE DELAY TIME	"AT" ANTI-TAILGATE ENABLE	"CL" RESET TO FACTORY DEFAULTS
"AD" ADVANCED PROGRAMMING	"BD" BRAKE DELAY TIME	"RA" RADIO ENABLE	

## 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. (0.75 A 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. REQUIRES STOP OR RESET TO CANCEL, AND ADDITIONAL COMMAND TO MOVE.
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 ENTRAPMENT PROTECTION INPUT	CONNECT TO APPROVED MONITORED DEVICES (EDGE SENSORS, PHOTO BEAMS) 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 ENTRAPMENT PROTECTION INPUT	CONNECT TO APPROVED MONITORED DEVICES (EDGE SENSORS, PHOTO BEAMS) 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	NOT USED WITH THIS MODEL OPERATOR.
+ -	24 VOLT BATTERY	NOT USED WITH THIS MODEL OPERATOR.

# Operator Accessory Connections

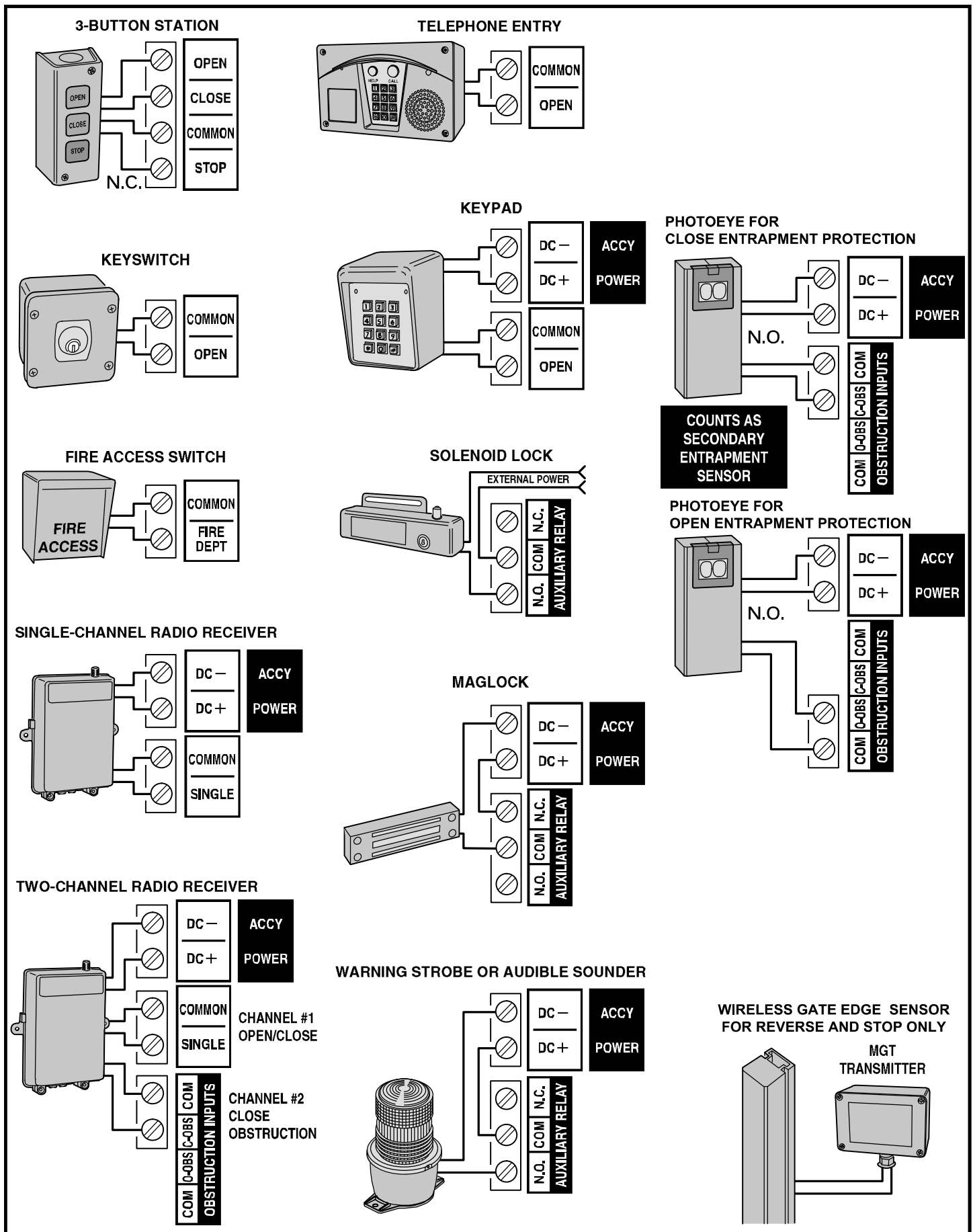


Figure 15. Operator Accessory Connections

# 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 slide 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.

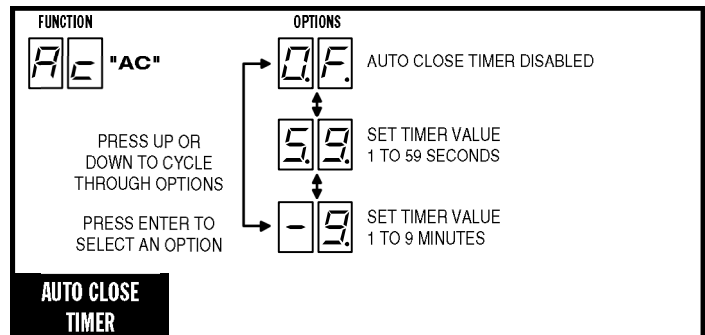
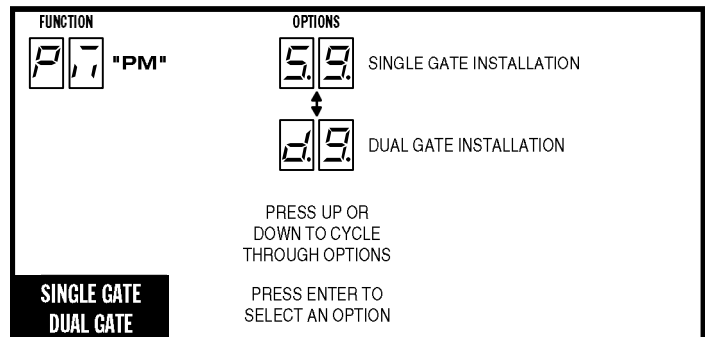
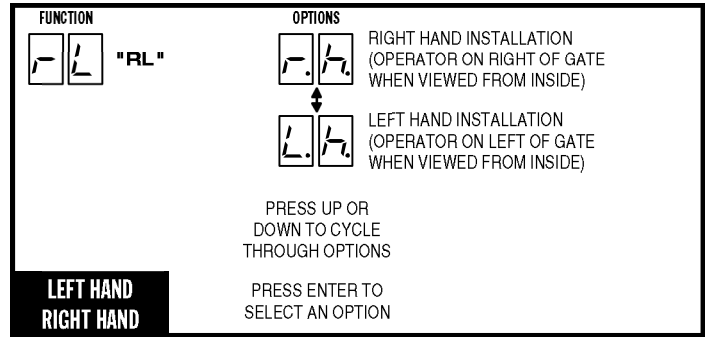
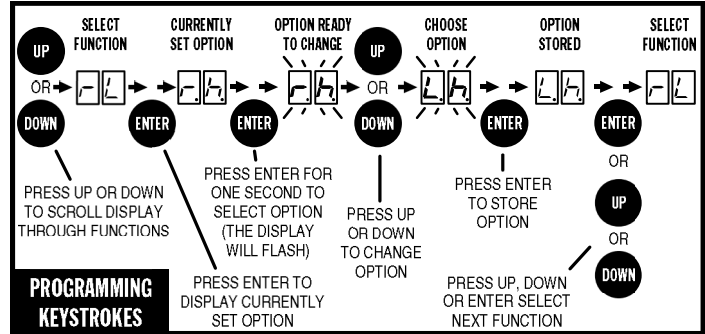
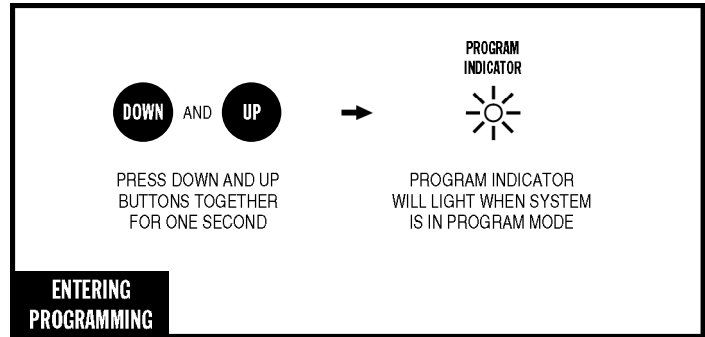
## Dual Gate Enable

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 24) 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

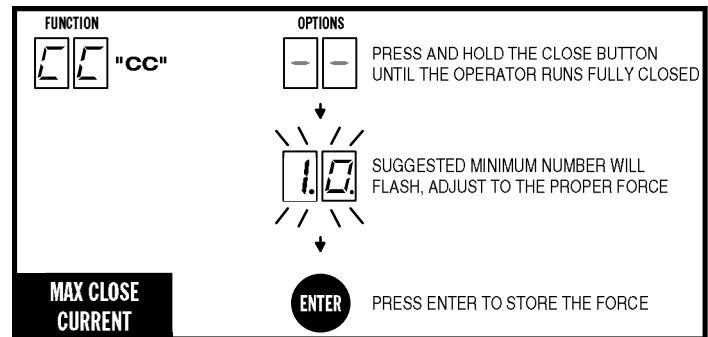
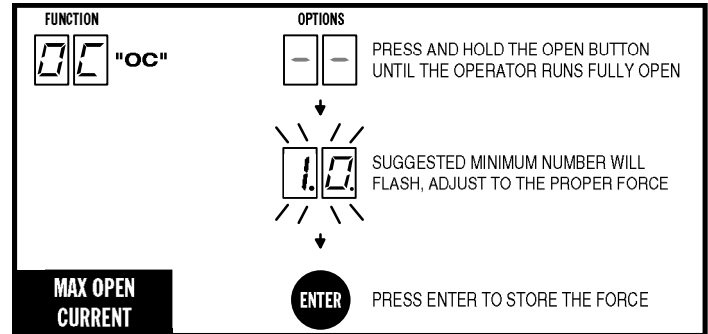
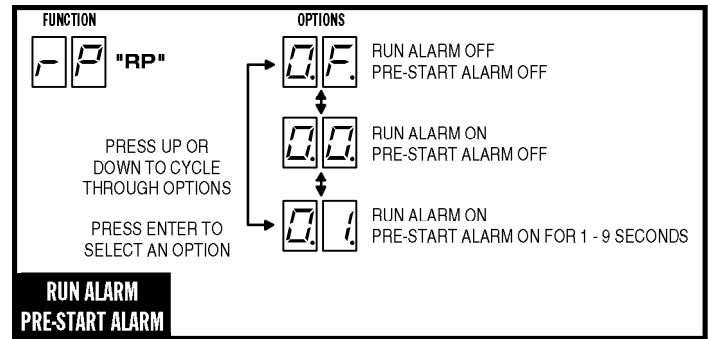
To detect obstacles or mechanical problems with the gate, the operator monitors its motor current. If the open current load exceeds the programmed maximum load range number, the operator will stop, reverse a short distance, then stop again. The Auto Close Timer will be disabled, and another open request 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.

## 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

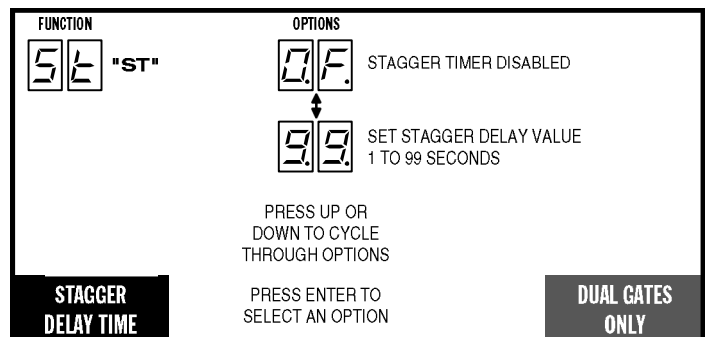
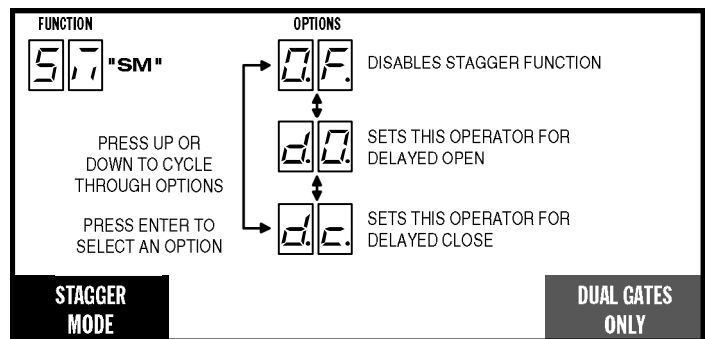
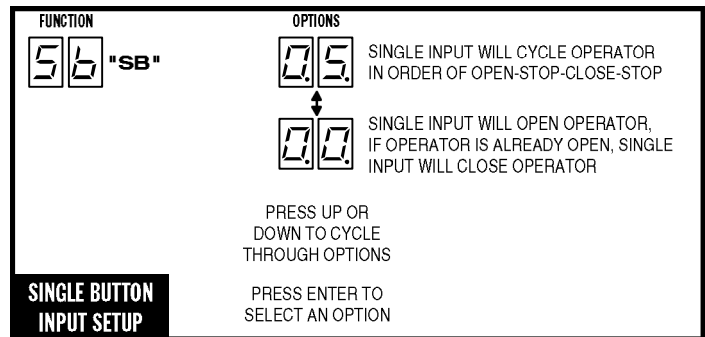
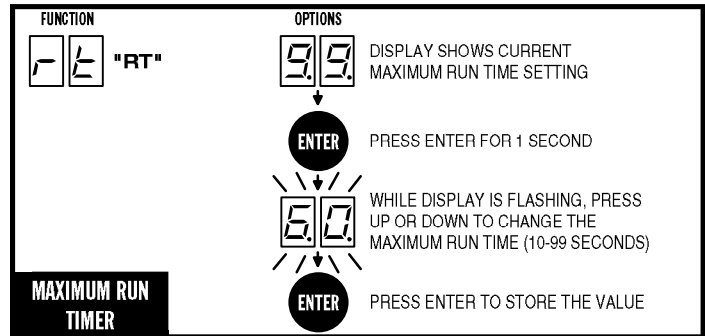
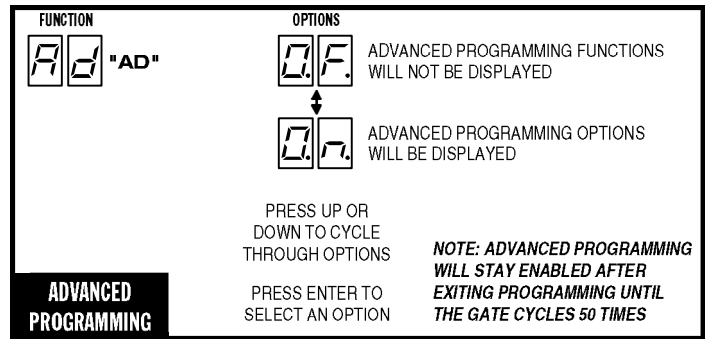
**This function is used in dual gate installations only.** The factory default sets the Stagger Mode to OFF. In dual gate installations the two operators communicate through the 3-wire **COMM LINK** interface. When using the Stagger Mode, set one operator for delayed opening and the other operator for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

## 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.





## Advanced Controller Programming (Cont.)

### 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:

- For solenoid locks with in-rush current less than 5a, the APeX AUX Relay will engage during any pending or actual gate motion (open direction only) to activate a solenoid lock.
- For solenoid locks with in-rush current between 5a and 13a, a separate interface relay is required. The APeX AUX Relay will energize during any pending or actual gate motion (open direction only) to activate the interface relay to activate the solenoid lock. When the solenoid lock is supplied by Tymetal as part of the gate operator order, the interface relay is added at manufacture and the controller is properly programmed to function as above.
- **Maglock:** The relay will energize during any pending or actual gate motion (open only) to deactivate a magnetic gate lock
- **Ticket Dispenser:** The relay will be energized at all times (enabling a ticket dispenser) unless the operator is fully open or in an entrapment position.
- **Strobe:** The relay will energize during any pending or actual gate motion (either open or close) to activate a warning strobe light.
- **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.

### Brake Delay Time

The factory default sets the Brake Delay to no delay (0 seconds). Heavy gates may require delayed braking to allow the gate to slow down before stopping it. The operator can be set to wait the length of the delay after running before applying the brake. The Brake Delay can be set from 0 to 3 seconds.

### 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.

### 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.

FUNCTION	OPTIONS
<b>AR</b> "AR"	<b>0.F</b> AUXILIARY RELAY DISABLED
	<b>1.L</b> AUXILIARY RELAY USED FOR MAGLOCK CONTROL
	<b>1.4</b> AUXILIARY RELAY USED FOR MAGLOCK OR SOLENOID CONTROL 3 SECOND DELAY TO RE-ENERGIZE
	<b>2.d</b> AUXILIARY RELAY USED FOR TICKET DISPENSER CONTROL
	<b>5.L</b> AUXILIARY RELAY USED FOR WARNING STROBE LIGHT
	<b>9.L</b> AUXILIARY RELAY USED FOR CONNECTION TO ALARM DEVICE

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS  
PRESS ENTER TO SELECT AN OPTION

**AUXILIARY RELAY MODE**

FUNCTION	OPTIONS
<b>RD</b> "RD"	<b>0.9</b> SET TIMER VALUE 1 TO 9 SECONDS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS  
PRESS ENTER TO SELECT AN OPTION

**REVERSE DELAY TIME**

FUNCTION	OPTIONS
<b>BD</b> "BD"	<b>0.0</b> SET TIMER VALUE 0 TO 3 SECONDS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS  
PRESS ENTER TO SELECT AN OPTION

**BRAKE DELAY TIME**

FUNCTION	OPTIONS
<b>CP</b> "CP"	<b>0.F</b> CONSTANT PRESSURE SET TO OFF (MOMENTARY PRESSURE ON)
	<b>0.P</b> OPEN BUTTON SET FOR CONSTANT PRESSURE
	<b>1.L</b> CLOSE BUTTON SET FOR CONSTANT PRESSURE
	<b>2.L</b> OPEN AND CLOSE BUTTONS BOTH SET FOR CONSTANT PRESSURE

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS  
PRESS ENTER TO SELECT AN OPTION

**CONSTANT PRESSURE MODE**

FUNCTION	OPTIONS
<b>SP</b> "SP"	<b>0.F</b> STANDARD OPERATION SHADOW LOOP INHIBITS CLOSING ONLY
	<b>0.n</b> OPEN INHIBIT ON, SHADOW LOOP INHIBITS OPENING AND CLOSING

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS  
PRESS ENTER TO SELECT AN OPTION

**SHADOW LOOP OPEN PREVENTION**

## Advanced Controller Programming (Cont.)

### Reset Cycle Count

The Controller counts 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.

### 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.

### 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.

**FUNCTION**  
[ENTER] "CT"

PRESS ENTER TO START THE CYCLE COUNT DISPLAY

1ST DISPLAY → 2ND DISPLAY → 3RD DISPLAY → 4TH DISPLAY  
00 → 01 → 04 → 20

EXAMPLE ABOVE SHOWS 10,420 CYCLES

DECIMAL POINT LIT ON 4TH DISPLAY

**RESET CYCLE COUNT**

**NOTE: PRESS ENTER FOR 2 SECONDS WHILE THE "CT" FUNCTION IS DISPLAYED TO RESET THE CYCLE COUNT TO ZERO**

**FUNCTION**  
[UP] [DOWN] "MA"

**OPTIONS**

[OFF] → [25] → [00]

DISABLES THE MAINTENANCE ALERT FUNCTION

SETS THIS MAINTENANCE ALERT TRIGGER FOR 5, 10, 15, OR 25 THOUSAND CYCLES

RESETS THE MAINTENANCE ALERT INDICATOR AND SETS THE MAINTENANCE ALERT COUNT TO ZERO

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**MAINTENANCE ALERT TRIGGER**

**FUNCTION**  
[ENTER] "MT"

**OPTIONS**

[OFF] → [99]

MID-TRAVEL STOP DISABLED (GATE RUNS FULL TRAVEL)

SET LENGTH OF OPENING TIME FROM 1 TO 99 SECONDS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**MID-TRAVEL STOP POSITION**

**FUNCTION**  
[ENTER] "AT"

**OPTIONS**

[OFF] → [ON]

ANTI-TAILGATE ENABLE OFF GATE REQUIRES AUTO OR MANUAL CLOSE

ANTI-TAILGATE ENABLE ON GATE CLOSES WHEN SHADOW LOOP CLEARS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**ANTI-TAILGATE ENABLE**

**FUNCTION**  
[ENTER] "RA"

**OPTIONS**

[OFF] → [ON]

INTERNAL RADIO RECEIVER DISABLED

INTERNAL RADIO RECEIVER ENABLED

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

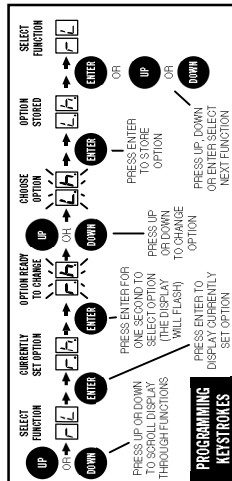
PRESS ENTER TO SELECT AN OPTION

**RADIO ENABLE**





**PRESS UP & DOWN BUTTONS FOR 1-SECOND TO ENTER PROGRAMMING**



**APEX FUNCTION DISPLAY INDICATIONS**

<b>"FL"</b>	LEFT OR RIGHT HAND OPERATION	<b>"LP"</b>	LOW POWER MODE
<b>"PM"</b>	SINGLE OR DUAL GATE	<b>"FS"</b>	POWER FAILURE MODE
<b>"AC"</b>	AUTO-CLOSE TIMER	<b>"SS"</b>	SOFT START/DURATION
<b>"FP"</b>	RUN ALARM PRE-START ALARM	<b>"GT"</b>	RESET CYCLE COUNT
<b>"OC"</b>	MAXIMUM OPEN CURRENT	<b>"MA"</b>	MAINTENANCE ALERT TRIGGER
<b>"CC"</b>	MAXIMUM CLOSE CURRENT	<b>"OR"</b>	OPEN/RESET INPUT
<b>"AD"</b>	ADVANCED PROGRAMMING	<b>"TG"</b>	ANTI-TAILGATE
<b>"RT"</b>	MAXIMUM RUN TIMER	<b>"MT"</b>	MID-TRAVEL STOPPOSITION
<b>"SB"</b>	SINGLE BUTTON INPUT-SETUP	<b>"AT"</b>	ANTI-TAILGATE ENABLE
<b>"SM"</b>	STAGGER MODE	<b>"RA"</b>	RADIO ENABLE
<b>"ST"</b>	STAGGER TIME	<b>"TL"</b>	LEARN TRANSMITTERS
<b>"AR"</b>	AUXILIARY RELAY MODE	<b>"TD"</b>	DELETE TRANSMITTERS
<b>"RD"</b>	REVERSE DELAY TIME	<b>"ML"</b>	LEARN MGT TRANSMITTERS
<b>"BD"</b>	BRAKE DELAY TIME	<b>"MD"</b>	ERASE MGT TRANSMITTERS
<b>"CP"</b>	CONSTANT PRESSURE MODE	<b>"MO"</b>	MOTOR TYPE SELECTION
<b>"SP"</b>	SHADOW LOOP OPEN PREVENTION	<b>"CL"</b>	RESET TO FACTORY DEFAULTS

**FUNCTION** **"MA"**

**OPTIONS**

DISABLES THE MAINTENANCE ALERT FUNCTION

SETS THIS MAINTENANCE ALERT TRIGGER FOR 8, 10, 15, OR 25 THOUSAND CYCLES

RESETS THE MAINTENANCE ALERT INDICATOR AND SETS THE MAINTENANCE ALERT COUNT TO ZERO

PRESS UP OR DOWN TO SCROLL THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**MAINTENANCE ALERT TRIGGER**

MID-TRAVEL STOP/DISABLED (GATE RUNS FULL TRAVEL)

SET LENGTH-OF-OPENING TIME FROM 1 TO 99 SECONDS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**MID-TRAVEL STOP POSITION**

**NOT FOR BARRIER GATES**

**FUNCTION** **"TL"**

**OPTIONS**

PRESS ENTER ONCE FOR EACH TRANSMITTER, UP TO 40 TRANSMITTERS (TOTAL)

"TL" WILL BLINK FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER

ACTIVATE THE TRANSMITTER

USUALY WILL SHOW " " THEN THE TRANSMITTER ID NUMBER - IF TRANSMITTER IS ALREADY ENTERED, "UP" WILL BE DISPLAYED, IF DECODE IS BAD "ERROR" WILL BE DISPLAYED

**LEARN TRANSMITTERS**

**FUNCTION** **"MD"**

**OPTIONS**

PRESS ENTER

"MD" WILL BLINK FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO DELETE ALL MGT TRANSMITTERS

TO DELETE ALL MGT TRANSMITTERS, PRESS ENTER FOR 23 SECONDS (TO EXIT WITHOUT DELETING ANY, ONLY PRESS ENTER)

THE DISPLAY WILL SHOW "DELETE ALL" AND THE CONTROLLER RETURNS TO PROGRAMMING MODE

**ERASE MGT TRANSMITTERS**

**FUNCTION** **"CT"**

**OPTIONS**

PRESS ENTER TO START THE CYCLE COUNT DISPLAY

1ST DISPLAY 2ND DISPLAY 3RD DISPLAY 4TH DISPLAY

EXAMPLE ABOVE SHOWS 10,420 CYCLES

DECIMAL POINT/LIT ON 4TH DISPLAY

**RESET CYCLE COUNT**

**NOTE: PRESS ENTER FOR 2 SECONDS WHILE THE "CT" FUNCTION IS DISPLAYED TO RESET THE CYCLE COUNT TO ZERO**

**FUNCTION** **"TG"**

**OPTIONS**

ANTI-TAILGATE FUNCTION DISABLED

ANTI-TAILGATE FUNCTION ENABLED

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**ANTI-TAILGATE**

**ONLY BARRIER GATES**

**FUNCTION** **"RA"**

**OPTIONS**

INTERNAL RADIO RECEIVER DISABLED

INTERNAL RADIO RECEIVER ENABLED

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**RADIO ENABLE**

**FUNCTION** **"ML"**

**OPTIONS**

"PRESERVE" WILL BLINK FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN AN MGT TRANSMITTER

ACTIVATE THE MGT TRANSMITTER, THE DISPLAY WILL BLINK FOR 30 SECONDS

"UP" WILL BE DISPLAYED, IF DECODE IS BAD "ERROR" WILL BE DISPLAYED

PRESS UP OR DOWN TO SELECT THE MGT FUNCTION

"UP" = OPEN OBSERVATION "CL" = CLOSE OBSERVATION

PRESS ENTER TO ACCEPT THE SELECTION

DISPLAY WILL SHOW " " FOR 6 SECONDS, THEN SHOW THE SECOND MGT TRANSMITTER IF USED

**LEARN MGT TRANSMITTERS**

**FUNCTION** **"CL"**

**ENTER**

WHILE "CL" IS DISPLAYED, PRESS ENTER

ALL PROGRAMMED DATA WILL BE CLEARED AND THE FACTORY DEFAULTS WILL BE STORED IN MEMORY.

**RESET TO FACTORY DEFAULTS**

**NOTE: THIS FUNCTION WILL NOT ERASE TRANSMITTERS, CURRENT SENSE VALUES, OR MOTOR TYPE**

**FUNCTION** **"SS"**

**OPTIONS**

SOFT START DISABLED

SET SOFT START DURATION TIME FROM 1 TO 16 SECONDS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**SOFT START/STOP DURATION**

**DC MODELS ONLY**

**FUNCTION** **"OR"**

**OPTIONS**

OPEN MODE OFF

OPEN COUNTER MODE

OPEN SUPERVISED MODE

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**OPEN/RESET INPUT**

**ONLY BARRIER GATES**

**FUNCTION** **"AT"**

**OPTIONS**

ANTI-TAILGATE ENABLE OFF GATE REQUIRES AUTO OR MANUAL CLOSE

ANTI-TAILGATE ENABLE ON GATE CLOSURES WHEN SHADOW LOOP CLEARS

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**ANTI-TAILGATE ENABLE**

**NOT FOR BARRIER GATES**

**FUNCTION** **"TD"**

**ENTER**

PRESS ENTER

"TD" WILL BLINK FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO DELETE ONE OR MORE TRANSMITTERS (TO EXIT WITHOUT DELETING ANY, PRESS ENTER)

TO DELETE ALL TRANSMITTERS, PRESS ENTER FOR 2 SECONDS, OR TO PICK TRANSMITTERS GO TO NEXT STEP OF TRANSMITTER ID NUMBERS

PRESS UP OR DOWN TO SCROLL THROUGH THE LIST OF TRANSMITTER ID NUMBERS

THE TRANSMITTER ID NUMBER IS DISPLAYED TO PICK A DIFFERENT TRANSMITTER ID, PRESS UP OR DOWN TO DELETE THE TRANSMITTER DISPLAYED

**DELETE TRANSMITTERS**

**FUNCTION** **"MO"**

**OPTIONS**

AC MOTOR ONLY

DC MOTOR ONLY WITH BRAKING

DC MOTOR WITH SOFT START/STOP

ALL INSTALLATIONS USE D2

NOTE: SELECTION MUST MATCH MOTOR BOARD!

3-PHASE AC MOTOR

AC MOTOR PRIMARY WITH BRAKING

DC MOTOR BACKUP WITH BRAKING

AC MOTOR PRIMARY WITH SOFT START/STOP

DC MOTOR BACKUP WITH SOFT START/STOP

PRESS UP OR DOWN TO CYCLE THROUGH OPTIONS

PRESS ENTER TO SELECT AN OPTION

**MOTOR TYPE SELECTION**

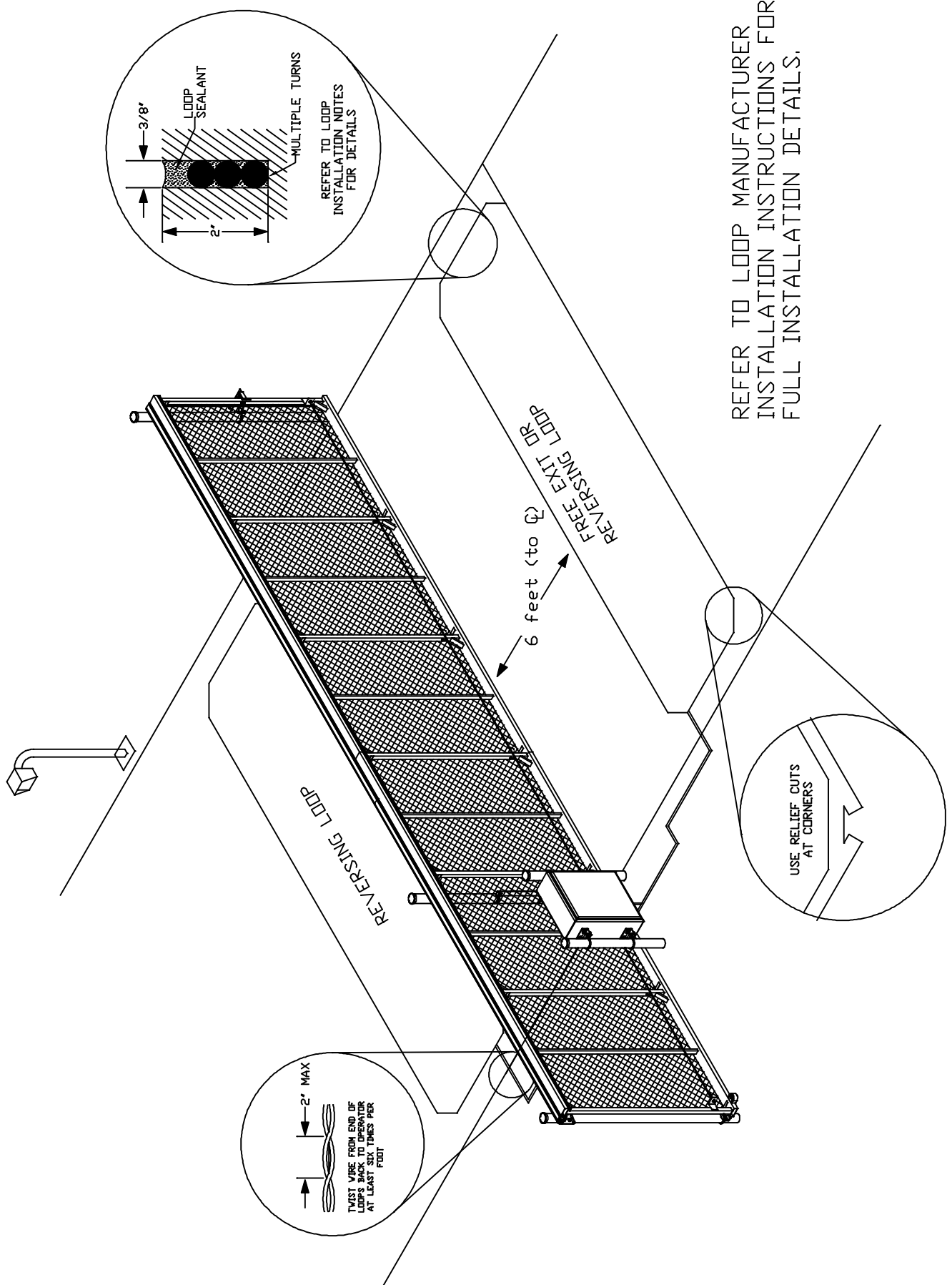
**FUNCTION** **"LP"**

**OPTIONS**

LOW POWER MODE

**"PM"**	SINGLE OR DUAL GATE
**"AC"**	AUTO-CLOSE TIMER
**"FP"**	RUN ALARM PRE-START ALARM
**"OC"**	MAXIMUM OPEN CURRENT
**"CC"**	MAXIMUM CLOSE CURRENT
**"AD"**	ADVANCED PROGRAMMING
**"RT"**	MAXIMUM RUN TIMER
**"SB"**	SINGLE BUTTON INPUT-SETUP
**"SM"**	STAGGER MODE
**"ST"**	STAGGER TIME
**"AR"**	AUXILIARY RELAY MODE
**"RD"**	REVERSE DELAY TIME
**"BD"**	BRAKE DELAY TIME
**"CP"**	CONSTANT PRESSURE MODE
**"SP"**	SHADOW LOOP OPEN PREVENTION

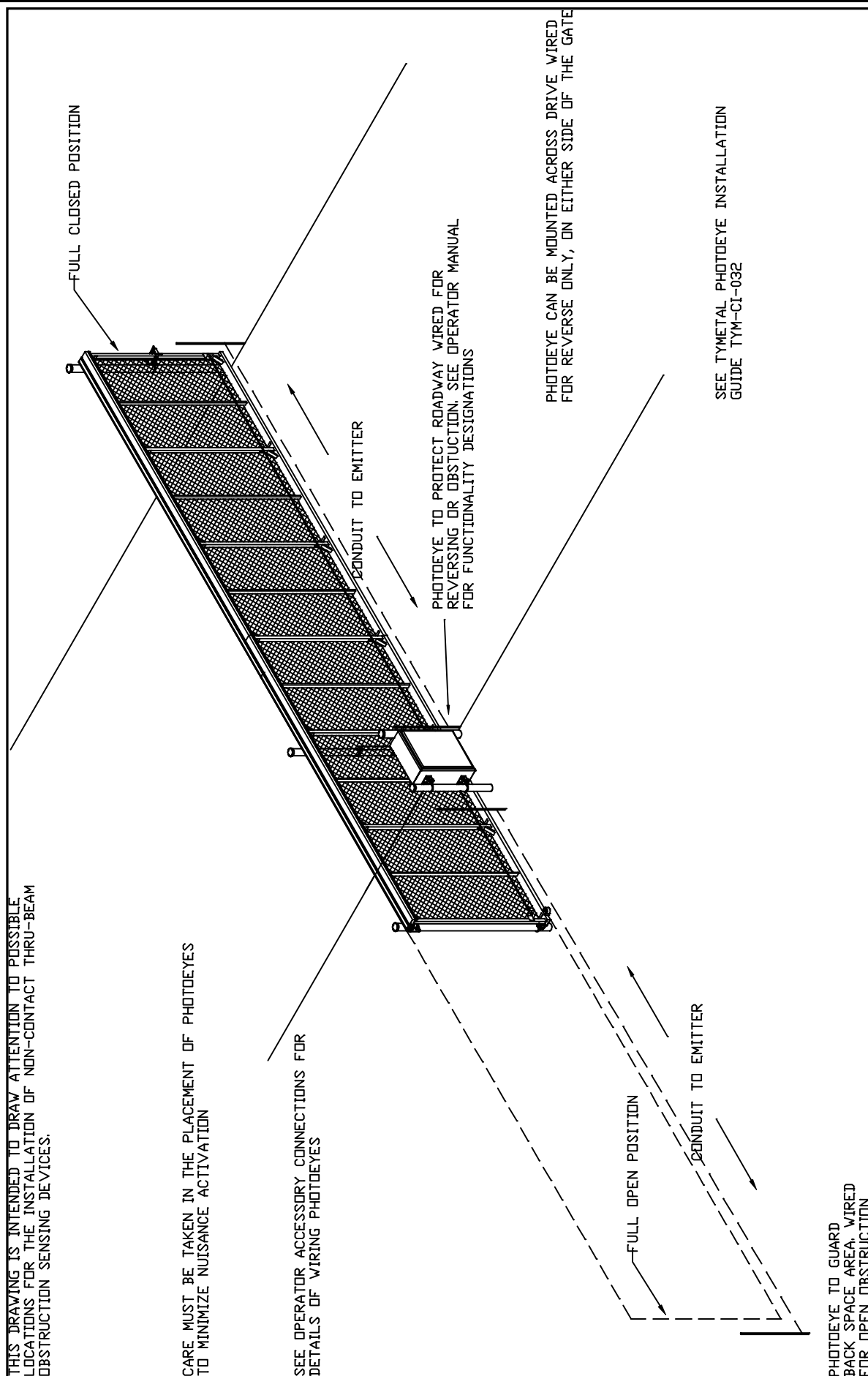
# Loop Layout Illustration



REFER TO LOOP MANUFACTURER  
INSTALLATION INSTRUCTIONS FOR  
FULL INSTALLATION DETAILS.



# Photoeye Installation Illustration



THIS DRAWING IS INTENDED TO DRAW ATTENTION TO POSSIBLE LOCATIONS FOR THE INSTALLATION OF NON-CONTACT THRU-BEAM OBSTRUCTION SENSING DEVICES.

CARE MUST BE TAKEN IN THE PLACEMENT OF PHOTOEYES TO MINIMIZE NUISANCE ACTIVATION

SEE OPERATOR ACCESSORY CONNECTIONS FOR DETAILS OF WIRING PHOTOEYES

PHOTOEYE TO PROTECT ROADWAY WIRING FOR REVERSING OR OBSTRUCTION. SEE OPERATOR MANUAL FOR FUNCTIONALITY DESIGNATIONS

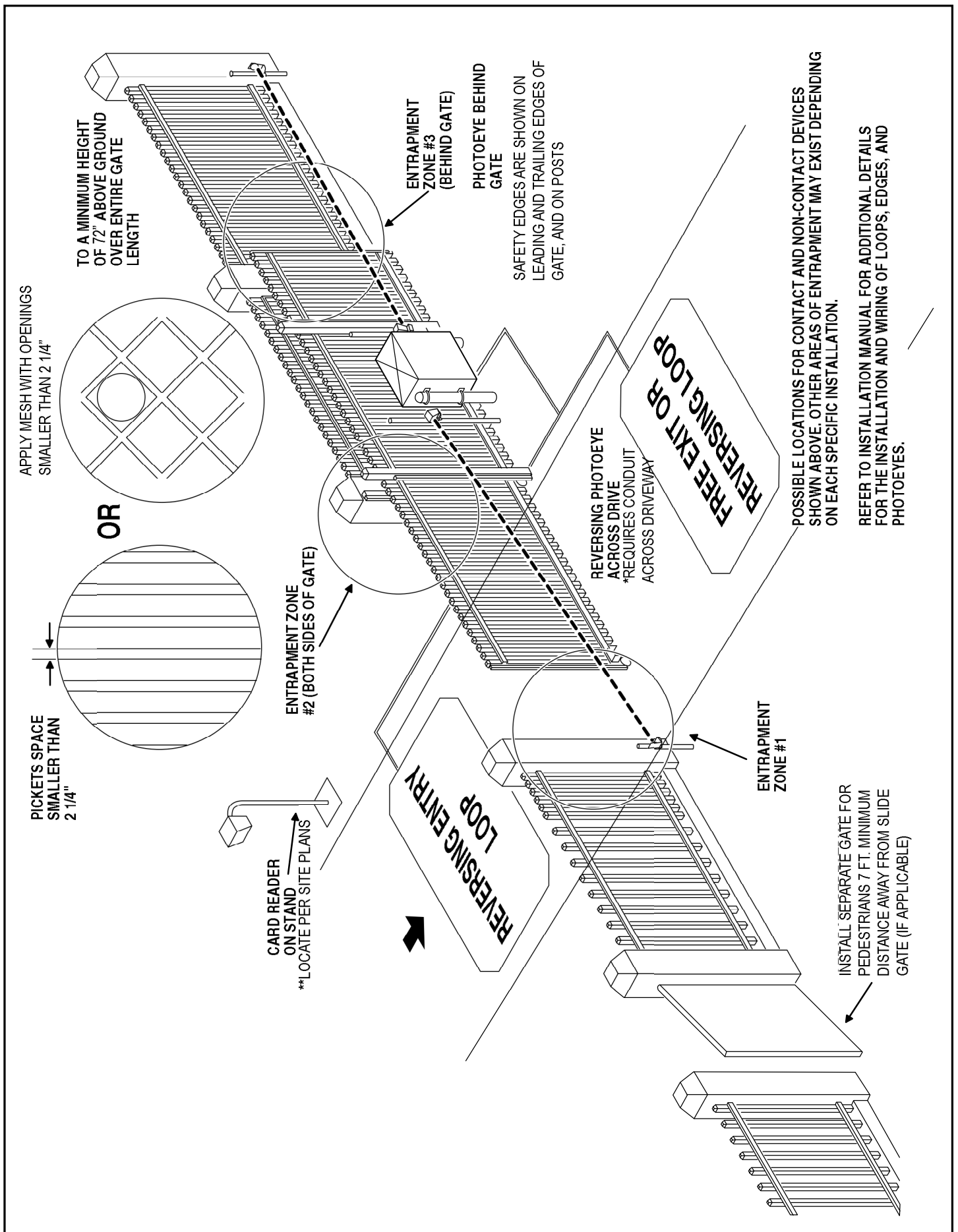
PHOTOEYE CAN BE MOUNTED ACROSS DRIVE WIRING FOR REVERSE ONLY, ON EITHER SIDE OF THE GATE

SEE TYPICAL PHOTOEYE INSTALLATION GUIDE TYM-CI-032

PHOTOEYE TO GUARD BACK SPACE AREA, WIRED FOR OPEN OBSTRUCTION



# Picket Gate Installation



## 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 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.

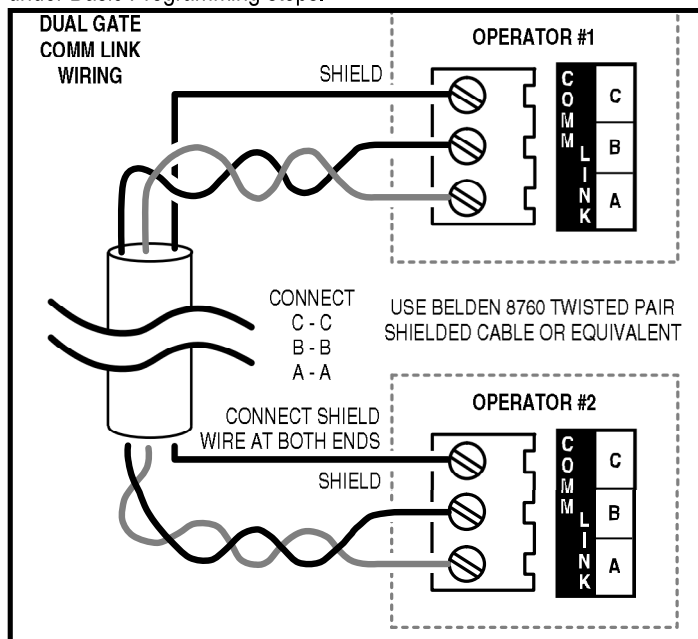


Figure 16. COMM LINK Wiring

## Optional In-Cabinet Heater

The operator can be ordered with an optional cold weather package that includes an in-cabinet heater to keep the drive train and electronics warm in cold environments.

In-cabinet heaters can also be ordered separately and should be wired to the operator as shown in Figure 17. Contact Technical Support for heater wiring information for a specific voltage and phase of operator.

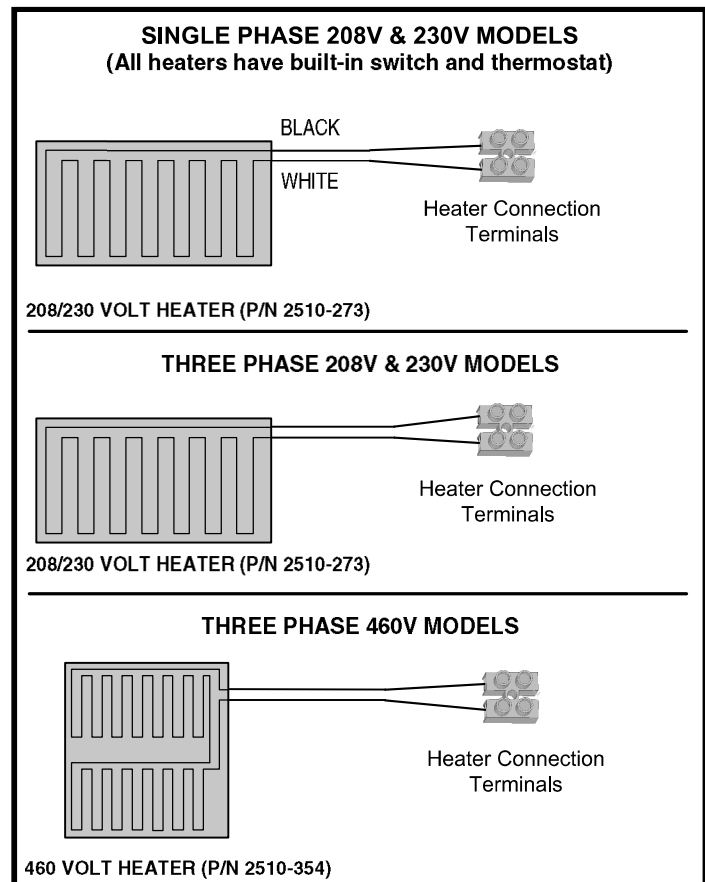


Figure 17. In-cabinet Heater Wiring

**⚡ WARNING ⚡**

**Risk of Electrocution. Disconnect main power before connecting in-cabinet heater.**

## 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. Cancels Fire Dept. Hold Open command (requires additional movement command to re-start operator).

### Reset Button

Resets overload relay. Cancels Fire Dept. Hold Open command (requires additional movement command to re-start operator).

### 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. Press open or close to restart gate operator.

### 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

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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.

### 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  $S\bar{t}$
- Full Close is displayed as  $F\bar{C}$
- Full Open is displayed as  $F\bar{O}$
- Entrapment is displayed as  $E\bar{n}$

### 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 or Obstruction

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 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)	<b>En 00</b> , CONTINUOUS ALARM BEEPER, GATE DISABLED	PRESS STOP BUTTON
MAXIMUM RUN TIMER EXCEEDED ON OPENING	<b>En 01</b> , AND <b>MAX RUN</b> 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	<b>En 02</b> , AND <b>MAX RUN</b> LED, CONTINUOUS ALARM BEEPER, GATE DISABLED	PRESS STOP BUTTON, CLEARS CONTINUOUS ALARM, THEN DOUBLE BEEP EVERY 5 SECONDS UNTIL NEXT OPERATION
COMM LINK FAILURE	<b>En 03</b> , AND <b>COMM LINK</b> 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	<b>En 04</b> , GATE DISABLED	PRESS STOP BUTTON
FAIL SAFE OR FAIL SECURE BECAUSE OF BATTERY VOLTAGE DROP BELOW 21.6 VDC DUE TO AC POWER LOSS	<b>En 05</b> , GATE DISABLED	BATTERY VOLTAGE MUST RISE ABOVE 24 VDC
OTHER CONTROLLER IN ENTRAPMENT (DUAL GATE)	<b>En 06</b> , GATE DISABLED	CLEAR ENTRAPMENT ON OTHER CONTROLLER (PRESS STOP)
LOW AC VOLTAGE AT CONTROLLER	<b>En 07</b> , GATE DISABLED	RESTORE AC POWER TO NORMAL LEVEL
INPUT TRIGGERED DURING ENTRAPMENT LOCKOUT	<b>En 08</b> , GATE DISABLED	PRESS STOP BUTTON
COMPATIBILITY PROBLEM	<b>En 09</b> , GATE DISABLED	UPDATE FIRMWARE AND RESET BOTH PAIRED CONTROLLERS
EEPROM PROBLEM	<b>En 10</b> , GATE DISABLED	TRY RESET, CALL TECH. SUPPORT
DC MOTOR MISMATCH	<b>En 11</b> , GATE DISABLED	REPROGRAM MOTOR TYPE OR CHANGE DC MOTOR BOARD, NEXT GATE MOVEMENT WILL RETRY DC MOTOR CHECK
MOTOR FAILURE	<b>En 12</b> , GATE DISABLED	CALL TECH. SUPPORT
AC POWER LOSS IN OPEN OR CLOSE IMMEDIATE POWER FAIL MODE	<b>En 13</b>	REAPPLY AC POWER
MAXIMUM RUN TIMER EXCEEDED AFTER AC POWER LOSS	<b>En 14</b>	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 Tymetal gate operators, contact the Technical Support Department at:

**1-800-328-4283 from 7 AM to 4:30 PM Eastern 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.

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

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

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

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

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

- A. Check for proper tension on all limit chains to be sure there is no jumping taking place. Mark one tooth and its corresponding link and run the gate. If the marks have moved, the chain is skipping.
- B. Check the setscrews in limit sprockets for tightness. In rotary limit boxes, check the rotary limit nut for sloppiness or stripped threads. 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.

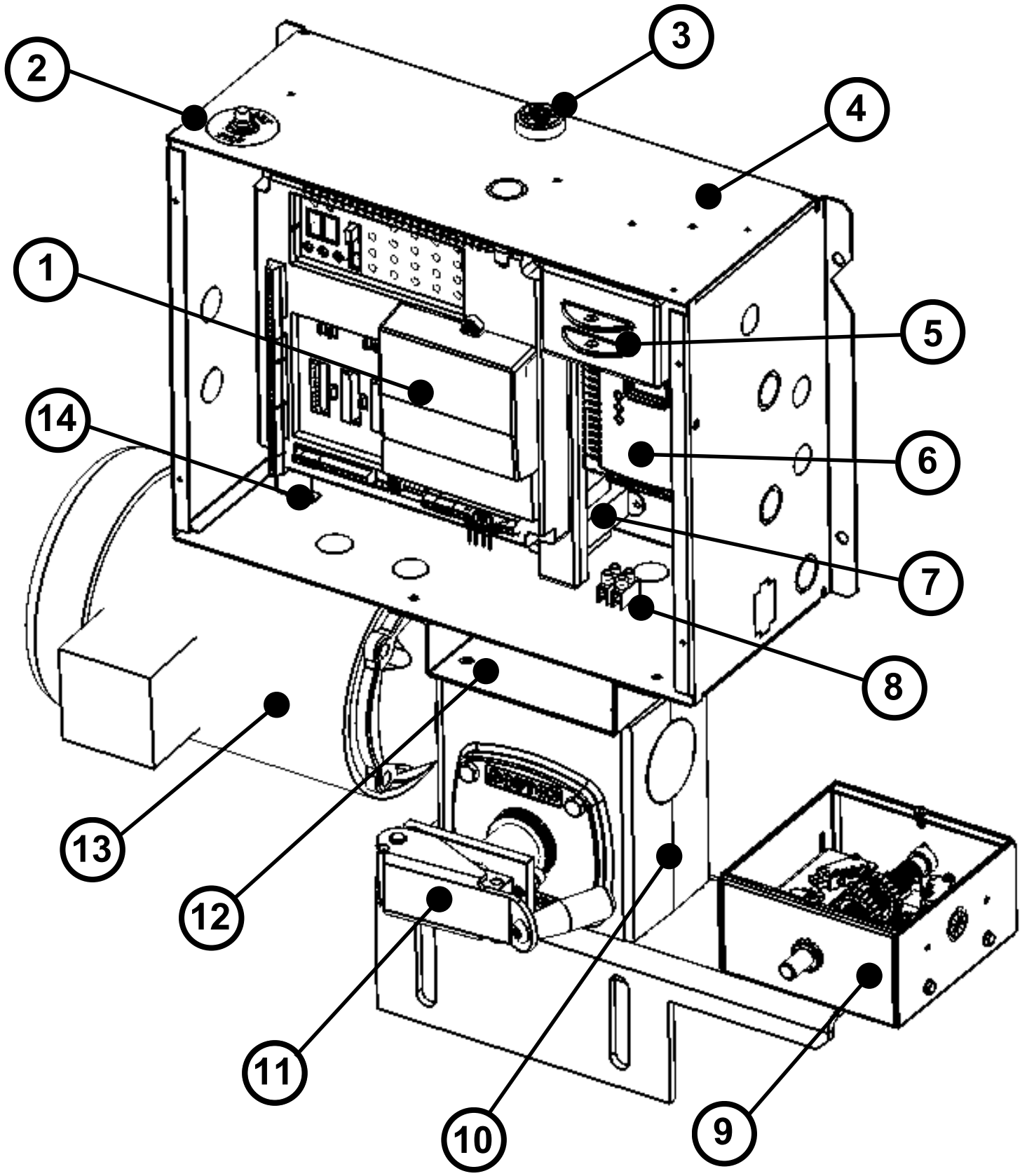
### **How to Order Replacement Parts**

Use the part numbers listed on the following pages.

Contact Tymetal Corp. 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.

# Model TYM-VSA Parts List





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## Preventative Maintenance

### ⚠ WARNING ⚠

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

### General

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

### Lubrication

- ❑ **Bearings** — For models which have pillow block style bearings with grease fittings, lubricate at least twice a year with a lithium complex based, petroleum oil NLGI 2 rated grease. Oilite and precision sealed bearings do not require additional lubrication.
- ❑ **Motor** — Motors have sealed ball bearings and do not require further lubrication. If bearing noise develops after several years of operation, bearings should be replaced by a motor repair company, or the motor should be replaced if necessary.
- ❑ **Drive Chain and Sprocket** — The main drive chain and sprockets should be inspected for wear, cleaned, and wiped down with a lightly oiled rag every six months.

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

## 6-Month Preventative Maintenance

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

## FCC Notice

This device complies with FCC Rules Part 15 and Industry Canada Rules & Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Variable Speed Drive Programming

### ⚠ CAUTION ⚠

This unit has been programmed at the factory. No changes should be necessary for normal operation. PLEASE CONSULT THE FACTORY BEFORE MAKING ANY CHANGES!

### Programming the Inverter

1. Turn power ON
2. Use the **ESC** button to advance to the next parameter, use the **SET** button to edit settings and then use the **SET** button to save/store setting
3. Use the **UP** or **DOWN** arrow buttons to advance from one function number to the next
4. When programming is complete, press and hold the **ESC** button until the screen shows 0.00
5. Turn power OFF

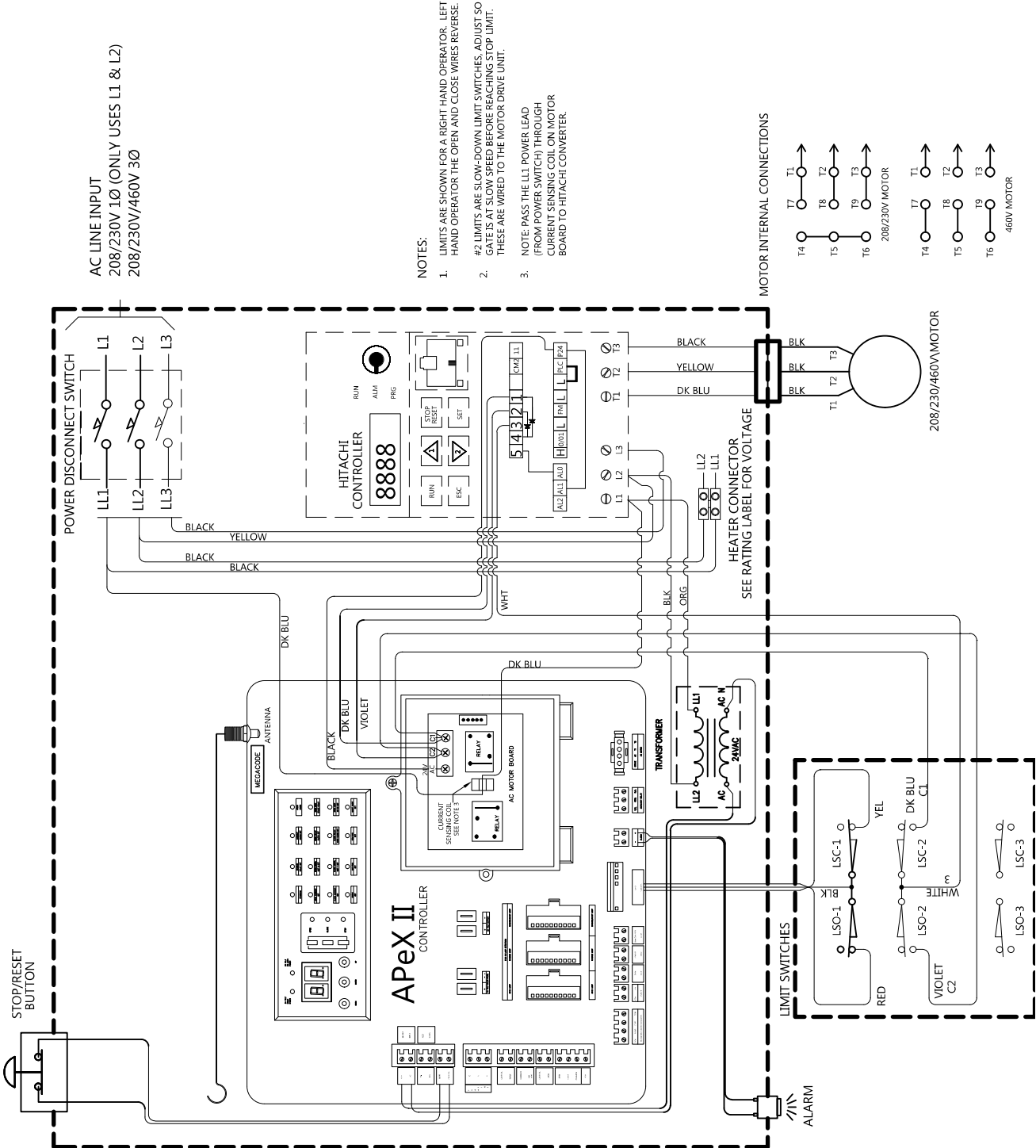


Figure 18 HATACHI NE-S1 Inverter

### NE-S1 SERIES

FUNCTION	DESCRIPTION	RECOMMENDED SETTING
F002	ACCEL TIME	3.00
F003	DECEL TIME	3.00
A001	SPEED SOURCE	00 (POT)
A002	RUN COMMAND SOURCE	01
A004	MAX SPEED	95 (Hz)
A020	TARGET SPEED	95.0 (Hz)
A021	SECOND SPEED	20.0 (Hz)
A022	MULTI SPEED FREQ	20.00 (Hz)
A081	AUTO VOLTAGE REG	01
B001	AUTO RESET	01
B130	INHIBIT DECEL OVERVOLTAGE	01
C003	TERM 3 FUNC	03
C004	TERM 4 FUNC	11
C005	RESET	18
C014	TERM 4 STATE	11
C036	ALARM RELAY	00
C140	AUTO RESET	3.0

# Model TYM-VSA Wiring Diagram

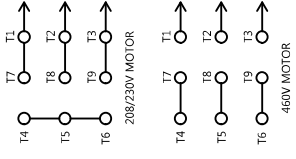


AC LINE INPUT  
208/230V 1Ø (ONLY USES L1 & L2)  
208/230V/460V 3Ø

**NOTES:**

1. LIMITS ARE SHOWN FOR A RIGHT HAND OPERATOR. LEFT HAND OPERATION THE OPEN AND CLOSE WIRES REVERSE.
2. #2 LIMITS ARE SLOW-DOWN LIMIT SWITCHES. ADJUST SO GATE IS AT SLOW SPEED BEFORE REACHING STOP LIMIT. THESE ARE WIRED TO THE MOTOR DRIVE UNIT.
3. NOTE: PASS THE LL1 POWER LEAD (FROM POWER SWITCH) THROUGH CURRENT SENSING COIL ON MOTOR BOARD TO HITACHI CONVERTER.

**MOTOR INTERNAL CONNECTIONS**



# Gate Operator Installation Checklist

---

INSTALLER CUSTOMER

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. The gate has been checked to make sure it is level and moves freely in both directions.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Potential pinch areas have been guarded so as to be inaccessible <b>OR</b> have contact and/or non-contact obstruction sensing devices installed.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. The installer has installed one or more contact or non-contact obstruction sensing devices, in compliance with UL325 requirements for this installation.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. If pedestrian traffic is expected, a separate pedestrian gate has been installed, a minimum of seven feet from the gate. The customer has been informed that <u>all pedestrian traffic must use the pedestrian gate.</u>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Warning signs have been installed on each side of the gate in highly visible locations. The customer has been informed that these signs must remain at all times.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. There are no controls installed on the gate operator, or within seven feet of the gate.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. The installer has properly adjusted the obstruction sensing feature and has tested the gate to make sure that the gate stops and reverses a short distance with minimal resistance applied (40 lbs. on a swing gate at the end of the gate, 75 lbs. on a slide gate)                |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. The installer has instructed the customer in the proper use of the gate operator and reviewed all of the operational functions, obstruction sensing devices, warning beeper and reset, etc.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. The installer has instructed the customer in the proper use of the operator's manual disconnect feature. The manual disconnect must never be used while the gate is in motion. The power switch must be turned off before using the manual disconnect and disengaging the operator. |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. The installer has reviewed all safety instructions with the customer, and has left the safety instructions and owner's information sheets for their reference.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. The installer has answered any questions the customer has regarding the operation of the gate operator and gate operator safety precautions.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. The installer has explained to the customer that a regular maintenance schedule for both the gate and the gate operator is recommended.  |

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

\_\_\_\_\_  
Customer's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Installer's Signature

\_\_\_\_\_  
Date