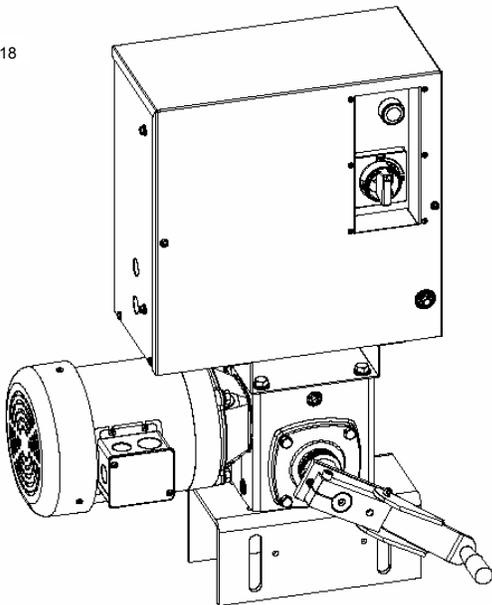


# Installation & Owner's Manual



***READ THIS MANUAL CAREFULLY BEFORE INSTALLATION OR USE***

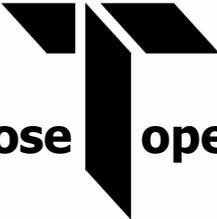
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## TYM-VariSpeed GATE OPERATOR



**As of date of manufacture, these units meet all ANSI/UL 325 safety requirements for vehicular gate operators.**

**We close  openings.**

**Tymetal Corp.  
2549 State Route 40  
Greenwich, NY 12834**

**800-328-GATE  
www.tymetal.com  
email gatekeeper@tymetal.com**

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<b>WARNING HIGH VOLTAGE</b>					<i>Figure 1</i>
<b>ONLY A QUALIFIED TECHNICIAN SHOULD SERVICE THIS GATE OPERATOR</b>					
PERIODICALLY TEST ALL THE SAFETY FEATURES OF THIS OPERATOR CONSULT THIS MANUAL FOR TEST PROCEDURES AND APPLICABLE TIME INTERVALS					
LOG DATE OPERATOR WAS TESTED				DATES OPERATOR SERVICED	
DATE TESTED	DATE TESTED	DATE TESTED	DATE TESTED		



## READ THESE STATEMENTS CAREFULLY AND FOLLOW THE INSTRUCTIONS CLOSELY.

The Warning and Caution boxes throughout this manual are there to protect you and your equipment. Pay close attention to these boxes as you follow the manual.

<b>WARNING</b>
Indicates a MECHANICAL hazard of INJURY OR DEATH. Gives instructions to avoid the hazard.

<b>CAUTION</b>
Indicates a MECHANICAL hazard of DAMAGE to your gate, gate operator, or equipment. Gives instructions to avoid the hazard.

<b>WARNING</b>
Indicates an ELECTRICAL hazard of INJURY OR DEATH. Gives instructions to avoid the hazard.

<b>CAUTION</b>
Indicates an ELECTRICAL hazard of DAMAGE to your gate, gate operator, or equipment. Gives instructions to avoid the hazard.



The TYMETAL TYM-VariSpeed Vehicular Gate Operator will provide convenience and assurance to the ultimate users for many years. It is ruggedly built of the finest materials and has been thoroughly inspected and tested at the factory. It has many features that will aid in the installation and testing of the complete gate system. The TYM-VariSpeed is certified to comply with UL Standard for Safety 325, as revised March 14, 2003.



## NOTICE

**Before attempting installation, read this manual carefully so that you will be thoroughly familiar with the features of the TYM-VariSpeed and its proper installation procedures.**

The TYM-VariSpeed slide gate operator is designated a Class III / IV Vehicular Slide Gate Operator. It is intended to operate a vehicular slide gate installed in a Limited Access Industrial location (Class III), such as a factory or loading dock area or other locations not intended to serve the general public. The TYM-VariSpeed vehicular gate operator may also be installed in Restricted Access Industrial locations (Class IV), for example a guarded industrial location or building such as an airport security area, prison or other locations not serving the general public, in which authorized access is prevented via supervision by security personnel.

The TYM-VariSpeed Gate Operator provides for a slow start, slow stop system to protect the mechanical components of the drive and gate. The Variable Speed Drive (VSD) is pre-programmed at the factory and should not need any adjustments in the field, although the slow start/slow stop activation points are adjustable via the Ramp Up & Ramp Down switches, see Page 13. The VSD will retain its programmed features even after a prolonged power failure.

Because the TYM-VariSpeed (as well as gate operators sold by other manufacturers) is designed to start and move gates weighing as much as 1800 pounds, the TYM-VariSpeed is capable of producing high levels of force. It is important in the design of the total gate system that designers, installers and users be aware of the hazards that may be associated with the **IMPROPER** design, installation and use of vehicular gate systems and gate operators.

The gate operator is only one part of a complete automatic gate operating system. As each location and usage is different, a properly designed system will include all applicable safety devices.

**As the designer and installer of the GATE SYSTEM**, you must advise the purchaser on the proper use of the gate system.

**The TYM-VariSpeed with TYMETAL's exclusive CGA2K™ Technology provides several features that can help reduce the hazards of your gate system.**

### Connections for External Entrapment Prevention Sensors

For Class III installations, an external non-contact (photoelectric device or similar) primary entrapment protection system ***must be installed*** for both the close and open gate directions. This can be a single device wired in parallel or two separate devices. When this equipment is installed, momentary contact on the pushbutton control will start or stop gate movement. The built-in auto-close timer may be used to automatically close the gate from a full open position after a user set time (from 2-60 seconds).

For Class IV installations, constant pressure on the pushbutton control is required to keep the gate in motion. When the pushbutton is released, the gate will stop. The auto-close timer may not be used in Class IV installations, and is automatically disabled unless the external entrapment protection system as described above is installed.

Because all gate system installations are different, the TYM-VariSpeed control panel provides independent connections for Open and Close non-contact (photoelectric or similar) sensors. In this way two separate non-contact sensors could be utilized to guard the gate area, one when closing and a second would provide protection when opening. Depending on the particular application two non-contact protection systems installed independently for the open and close directions may provide more effective entrapment protection than a single system for both directions. Any number of additional contact-type entrapment protection systems (edge sensors, etc.) may be installed to protect the gate area as needed.



## NOTICE

**The important safeguards and instructions in this manual can not cover all possible conditions and situations which may occur during its use. It must be understood that common sense and caution must be exercised by the person(s) installing, maintaining and operating the equipment described herein. Do not use this equipment for any other than its intended purpose - operating a slide gate.**

**Audio Alarm:** This alarm has a dual function. The first function is a pre-move/gate in motion alarm. When a command is recognized by the motor control board this alarm is activated 3-seconds before the motor is energized and the gate starts to move. This is continuously activated while the gate is in motion. The second function is an entrapment notification alarm (for Class III). This alarm sounds when a second activation of the external primary entrapment system has been detected by the motor control board before an end limit (open or close) is reached. The pulsing rate of the alarm is different (faster) when in the entrapment notification mode than the pulsing rate of the pre-move/gate in motion alarm.

**Main Power Disconnect Switch and Wiring Compartment:** When this switch is in the off position, the main power is disconnected from the Variable Speed Drive, Motor Control Board, and the power transformers. Use caution as the auxiliary lock circuit may still be powered.

### SMART™ Self adjusting MAXimum Run Timer:

The TYM-VariSpeed has a Self adjusting MAXimum Run Timer, SMART™. The amount of time for the first few cycles of operation are registered and averaged within the motor controller circuitry. After the first few initial cycles, if the gate is activated and no other command is given and an end limit (open or close) is not reached in the previously counted cycle time plus approximately 2 seconds, the operator will be turned off.

### OTHER FEATURES

**Auto Close Timer:** Can be enabled and disabled, when enabled the timer to close is adjustable from 2 to 60 seconds. Provides an automatic closure of the gate from any partially opened position.

**Right-Hand/Left-Hand Installation:** The TYM-VariSpeed can be configured for left or right-hand gate installations, see page 12. The TYM-VariSpeed is shipped from the factory configured for right-hand installations.

**Diagnostic LED's:** These provide a visual status of the various external devices connected to the TYM-VariSpeed. For normally closed inputs (such as the stop button) the associated LED will be on unless the device is activated or disconnected. For normally open inputs (such as the open button), the associated LED will be off unless the device is activated.

# 4 | A: GATE SYSTEM DESIGN / INSTALLATION



**WARNING!**

**TO REDUCE THE RISK OF SEVERE INJURY OR DEATH: READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS AND GATE SYSTEM DESIGN PARAMETERS!**

## GATE SYSTEM DESIGN AND INSTALLATION SAFETY CHECK LIST

- The TYM-VariSpeed operator may be installed on a Class III or IV Vehicular Slide Gate. See page 3 for an explanation of the different Class locations.
- Make sure that the gate moves freely, all rollers are in good working order, the gate does not bind in any manner and the gate area is clean and free of irregularities. **DO NOT INSTALL THE OPERATOR UNTIL ALL GATE PROBLEMS HAVE BEEN CORRECTED.**
- Install the operator on the inside of the property/fence line. **DO NOT** install an operator on the public side of the fence line or gate unless **all parts** of the drive system will be enclosed and inaccessible.
- Make sure the gate operating system is placed far enough back from the road to eliminate traffic backup. The distance from the road, size of the gate, usage level and gate cycle/speed must be taken into consideration to eliminate potential hazards.
- The gate must be installed in a location so that enough clearance is supplied between the gate and any adjacent structures when opening and closing to reduce the risk of entrapment.
- For ORNAMENTAL “GRILL TYPE” GATES (or any other type of open gate where a handhold or toehold may be achieved), injuries may occur when people put arms through the openings or children “ride” the gate by standing on the bars and holding on to the gate. **THIS POTENTIAL HAZARD CAN BE MINIMIZED BY INSTALLING A MESH SCREEN ON THE GATE.** TYMETAL strongly recommends the entire gate and adjacent fence area the gate covers when open be meshed or guarded such that a handhold or toehold cannot be achieved. At a minimum all openings on a horizontal slide gate must be guarded or screened from the bottom of the gate to a minimum of 4 feet above the ground to prevent a 2-1/4 inch (57.15 mm) sphere from passing through the openings anywhere in the gate, and in that portion of the fence the gate covers

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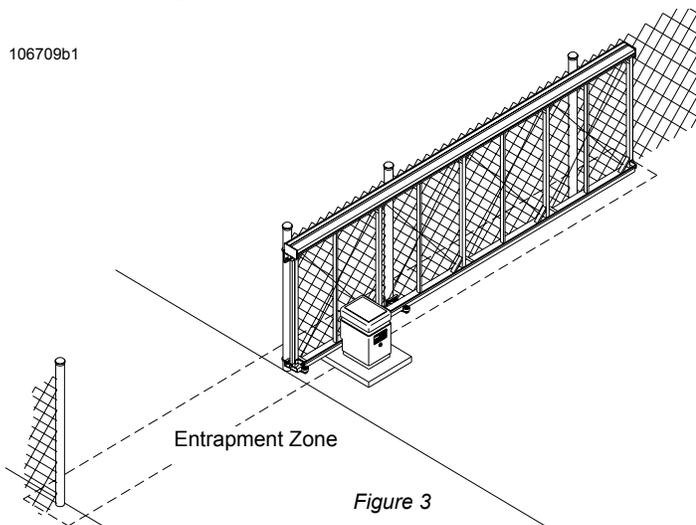
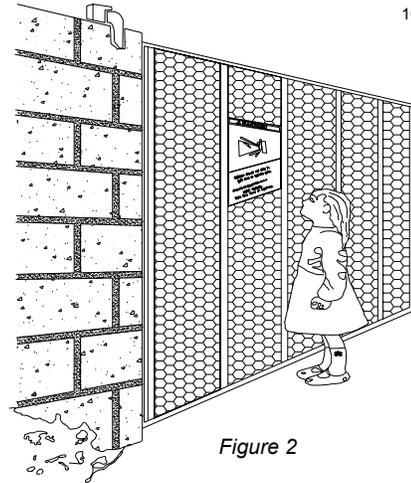


Figure 3



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Figure 2

when in the open position. See Figure 2.

- All TYMETAL gate operators are **VEHICULAR GATE OPERATORS** and as such are **NOT INTENDED FOR PEDESTRIAN** traffic. In installations where pedestrian passage through the fence is necessary, install a pedestrian access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the vehicular gate and the pedestrian access opening such that persons will not come into contact with the vehicular gate during the entire path of travel of the vehicular gate. See page 21 for additional information.
- Install leading edge detectors and/or photocells in your design to protect system entrapment zones. TYMETAL can provide these products for incorporation in your gate system design.
- Use the illustration at left (Figure 3) and the information and diagrams on pages 10, 11, and 12 to minimize the risk of injury in your design of the slide gate operator system. **IDENTIFY THE ENTRAPMENT ZONES AND PINCH POINT AREAS IN YOUR GATE.** Design the gate installation to minimize the risk of entrapment in these areas. Install additional safety equipment such as edges sensors and photocells to further minimize risk. All entrapment zones are required to be protected.
- **Entrapment Zones:** Design in personal entrapment protection devices to protect people from entrapment in the zones shown in Figure 3 at left and the information and diagrams on pages 10, 11, and 12. Install vertical posts with gate edges attached on both sides of the gate to prevent body entrapment.
- **Pinch Points:** Use protective measures (guards, padded edges, etc.) to protect people from the pinch points shown in Figure 3 at left and the information and diagrams on pages 10, 11, and 12. If gate does not have TYMETAL's internal roller design, attach roller guards in cantilevered gate systems to minimize the risk of hands being caught between the top of the gate and the roller.



**ALL APPROPRIATE SAFETY FEATURES MUST BE INCORPORATED INTO YOUR GATE SYSTEM.**



- DO NOT connect any auxiliary equipment to the TYM-VariSpeed operator (detectors, card readers, etc.) until the gate operator and all its functions are fully tested. Only connect one device at a time and ensure its proper function(s) before moving on to the next device.
- DO NOT locate any control device (key switch, switch, key pad, card reader, etc.) in a position where it may be activated by a person reaching through the gate or while touching the gate in any manner. Locate all control devices a minimum of 10 feet from the gate when opened or closed.
- Outdoor or easily accessible controls must be of the security type to prevent unauthorized use of the system.
- Install all devices that will Open, Close or Stop the gate in such a manner that THE GATE WILL BE IN FULL VIEW WHEN THE DEVICE IS OPERATED.
- Before activating the "timer to close" option of the TYM-VariSpeed, ENSURE THE PERSONAL ENTRAPMENT PROTECTION DEVICES (operator reversing feature, edges, photocells) ARE OPERATING and install VEHICLE DETECTOR LOOPS AND VEHICLE DETECTORS for protection of user vehicles. Read the manual for information on the installation of these devices. IF VEHICLE DETECTOR LOOPS HAVE BEEN INSTALLED TO PREVENT THE GATE FROM CLOSING ON A VEHICLE, INSTRUCT THE USER TO PERIODICALLY CHECK THE OPERATION OF THE DETECTORS.
- USE EXTREME CAUTION WHEN WORKING NEAR THE INTERNAL MECHANICAL DRIVE COMPONENTS when the operator cover is removed. Apply power to the operator only when instructed to do so.
- When the cover of the TYM-VariSpeed Control Box cover is removed, high voltage will be exposed. EVEN IF THE RED POWER LIGHT IS NOT LIGHTED, HIGH VOLTAGE AC MAY STILL BE PRESENT. NEVER LEAVE THE INSTALLATION WITH THE CONTROL BOX COVER REMOVED.
- ALWAYS TURN OFF THE POWER AT THE DISCONNECT SWITCH BEFORE ATTEMPTING SERVICE OF EITHER THE ELECTRICAL OR MECHANICAL SYSTEMS. ALLOW A WAITING PERIOD BEFORE REMOVING THE CONTROL BOX COVER AS HIGH VOLTAGE AC WILL STILL BE PRESENT INSIDE THE CONTROL BOX FOR APPROX. TWO MINUTES AFTER THE POWER IS REMOVED.
- SECURELY ATTACH THE WARNING SIGNS provided with the TYM-VariSpeed on the gate (one on the outside and one on the inside) where they can be seen by persons in the area of the gate to alert them of automatic gate operation. (If the user refuses to have the warning signs installed, TYMETAL recommends that you note this on your records and have the user sign a disclaimer.) See Figure 4.



Figure 4

## AS THE INSTALLER YOU ARE RESPONSIBLE FOR:

- 1 ASSURING THAT THE GATE AND OPERATOR SYSTEM, WHEN FULLY INSTALLED AND OPERABLE, COMPLIES WITH ALL APPLICABLE REQUIREMENTS OF UL325: STANDARD FOR SAFETY FOR DOOR, DRAPERY, GATE, LOUVER AND WINDOW OPERATORS AND SYSTEMS.
- 2 ASSURING THAT THE OWNER/END USER OF THE SYSTEM UNDERSTANDS ITS BASIC OPERATION AND SAFETY FEATURES. IN PARTICULAR, BE SURE THE OWNER/END USER UNDERSTANDS THE LOCATION AND OPERATION OF A MANUAL DISCONNECT (WHERE PROVIDED) OR HOW TO OPERATE THE GATE MANUALLY.
- 3 YOU ALSO HAVE THE PRIMARY RESPONSIBILITY OF INSURING THAT ALL POSSIBLE OPERATIONAL HAZARDS HAVE BEEN CONSIDERED AND ELIMINATED. YOU MUST ADVISE AND WARN THE PURCHASER AND THE ULTIMATE USER OF ANY HAZARDS THAT YOU HAVE NOT BEEN ABLE TO ELIMINATE.
- 4 POINTING OUT TO THE OWNER/END USER OF THE GATE SYSTEM THAT CHILDREN OR PETS ARE NOT ALLOWED TO PLAY ON OR NEAR THE GATE, FENCE OR ANY PART OF THE SYSTEM, AND THAT THE SAFETY INSTRUCTIONS SUPPLIED WITH THIS OPERATOR AND THEIR IMPLEMENTATION ARE THE RESPONSIBILITY OF THE OWNER/END USER.
- 5 LEAVING THE INSTALLATION AND MAINTENANCE MANUAL FOR THIS OPERATOR AS WELL AS ANY ADDITIONAL SAFETY INFORMATION SUPPLIED WITH THIS OPERATOR OR OTHER COMPONENTS OF THE GATE SYSTEM WITH THE OWNER/END USER.
- 6 NOT PLACING IN SERVICE THIS OPERATOR IF YOU HAVE ANY QUESTIONS ABOUT THE SAFETY OF THE GATE OPERATING SYSTEM. CONSULT THE OPERATOR MANUFACTURER.



## ELECTRICAL POWER REQUIREMENTS

**NOTE:** Before connecting the operator, use a voltmeter to insure that the electrical service is applicable according to the product label. Connection to the improper voltage and/or phase is the most common cause of unit failure in new installations and is NOT covered by the warranty.

In installations with more than one operator, each operator must have a separate service from the breaker panel. The electrical hookup is made in the junction box located in the upper right front corner of the control panel.

The AWG wire size for the electrical service depends on the distance of the operator from the breaker panel. Refer to the table below to determine the correct wire size. The NOMINAL column is the ideal distance from the breaker panel to the operator for a given wire size. The distances shown in the NOMINAL column should never be exceeded. For distances greater than 1600', it is recommended that your local utility be contacted to install a service feeder for the installation.

Wiring from external controls such as guard shack, telephone entry, keypad or card reader systems should be brought to the operator by a conduit separate from the high voltage electrical hookup. Power conduit and control wire conduit are recommended to have appx 18" separation for parallel runs exceeding 50' and a local GROUND ROD within 3' of gate operator. Low voltage control wires MUST NEVER be routed in the same conduit as high voltage AC power wires. Always consult and follow the National voltage AC power wires. Always consult and follow the National Electrical Code and any applicable local electrical codes. **MAKE SURE POWER IS OFF BEFORE WIRING OR SERVICING THE OPERATOR.**

**NOTE:** The TYM-VariSpeed control board comes equipped with a built-in surge protection which MAY prevent damage to the controller board in the event of a nearby lightning strike or a surge in the power lines. For the surge protector to function, and as a general precaution, the operator must be properly grounded. The third wire for the ground must be installed.

### WARNING

**Shock hazard: Do not route the low voltage wires in the same conduit as high voltage wires. Follow all local electrical codes and the National Electrical Code when wiring.**

### WARNING!

**TO REDUCE THE RISK OF DAMAGE DUE TO LIGHTNING:**

**Ensure a solid ground from the ground wire in the service entrance 4 x 4 handy box to the electrical service ground or to a earth ground stake near the TYM-VariSpeed operator.**

## ADDITIONAL LIGHTNING PROTECTION

For those areas where a high probability of ground lightning strikes exists (Florida, Georgia, etc.), additional lightning protection should be installed in the TYM-VariSpeed. Although it may not be possible to protect against all strikes, additional protection will substantially reduce the occurrence of lightning damage. Lightning data indicates that the most strikes enter a gate operator through the power lines. Effective protection requires that the surge current from the lightning strike be shunted to ground. This must be done without raising the potential of the circuitry in the TYM-VariSpeed, with respect to ground, to the levels that will damage the solid state circuitry. Lightning strikes generate enormous currents for very short periods of time. Unfortunately, the period of time is long enough to damage solid state components and many times, other components. The key to success is a very low resistance path from the surge protector to ground for these currents in addition to a surge protector that will act fast enough to protect the solid state circuitry. Several manufacturers offer suitable surge protectors.

## PLACING THE VEHICLE DETECTOR LOOPS

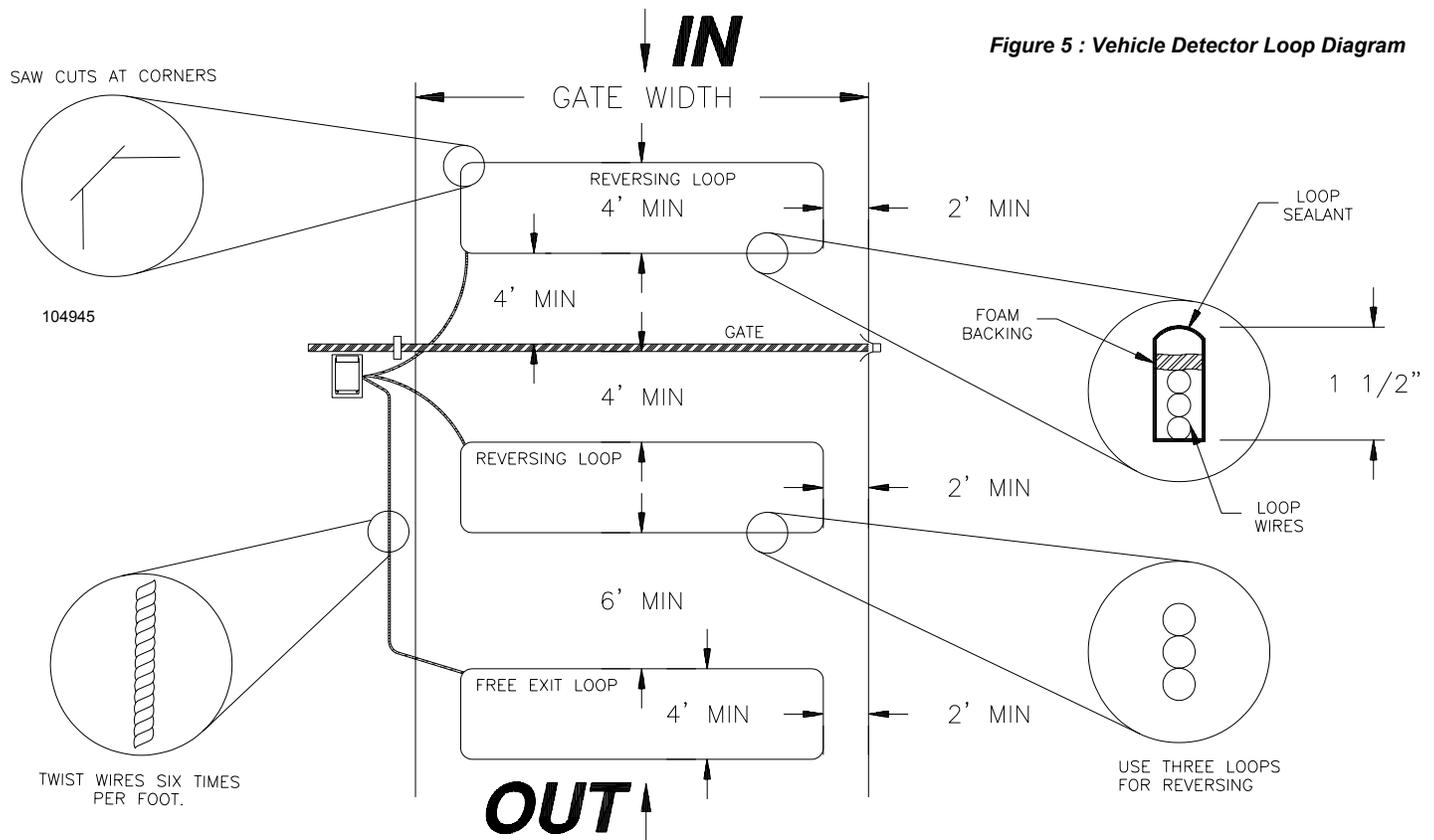
Proper placement of vehicle detector wire loops is critical if the loops are to provide satisfactory, extended service. The most important considerations are: 1) Proper wire type and, 2) Good, tight connections

### WARNING!

**RISK OF ENTRAPMENT**

**Vehicle detector loops will not detect smaller vehicles such as motorcycles, golf carts, bicycles, or pedestrians. Photoelectric detectors, edge detectors and separate pedestrian access must be installed.**

TYM-VS Unit Voltage & Phase	WIRE SIZE and RECOMMENDED MAXIMUM RUN LENGTHS							
	#16 Ga.	#14 Ga.	#12 Ga.	#10 Ga.	#8 Ga.	#6 Ga.	#4 Ga.	#2 Ga.
208 V, 1P	100 Feet	160 Feet	255 Feet	405 Feet	650 Feet	945 Feet	1500 Feet	>2000 Feet
240 V, 1P	120 Feet	195 Feet	305 Feet	490 Feet	775 Feet	1250 Feet	1950 Feet	>2000 Feet
208 V, 3P	180 Feet	290 Feet	460 Feet	725 Feet	1150 Feet	1850 Feet	>2000 Feet	>2000 Feet
240 V, 3P	230 Feet	375 Feet	595 Feet	945 Feet	1500 Feet	>2000 Feet	>2000 Feet	>2000 Feet
480 V, 3P	815 Feet	1300 Feet	2000 Feet	>2000 Feet				



**Figure 5 : Vehicle Detector Loop Diagram**

from the loop to the loop terminating connector. When a "Stand Alone" vehicle detector is used, the detection loop is connected to the wire harness on the detector itself.

The TYM-VariSpeed provides for the use of two loop systems: 1) A "reversing" loop that will prevent the gate from closing on a vehicle that has stopped in the path of the gate and, 2) A "free exit" loop that will open the gate by detecting a vehicle which is inside the gated area and wishes to leave. If "free exit" detection is not desired, this loop will not be needed. Note the "reversing" loop is normally made up of two loops connected to one detector. See Figure 5 on the following page.

Two different types of installations will usually be encountered: 1) If the driveway material is already in place, saw cuts will be needed to accommodate the loop wires.

2) For loops where the paving material will be installed after the loop is positioned, it is necessary that the loop wires be placed in Schedule 40 PVC pipe to maintain uniform loop spacing with respect to the surface of the pavement. The loop should be placed 1.5 inches below the surface of the pavement and at least 2" above any reinforcing steel. The lead-in wires need not be in PVC, but must have at least six (6) twists per running foot.

For a saw-cut installation, observe the method recommended in Figure 5 for the corners. When installing a two-loop reversing system it is best to bring the twisted lead wires from each loop to the operator so that the loops may be properly phased. The saw cut must be to a depth of 1.5 inches, clean and with no sharp corners. After placing the

wires, it is essential that the wires be held tightly in place by the foam backing and that no voids exist that can collect water which might freeze and push the loop wires out of the slot. The sealant used should match the paving material and should not be hard setting. The lead-in wires must have at least six (6) twists per foot.

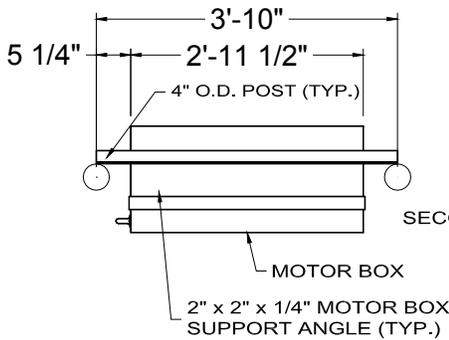
**NO SPLICES ARE ALLOWED IN THE LOOP OR THE LEAD-IN WIRE TO THE FIRST JUNCTION BOX** Above ground splices may be used providing the wire is twisted, soldered and moisture sealed. For best long term results, do not use wire nuts anywhere in the loop system. For connections to the loop detector, gas tight crimp type terminals should be used, and soldered if possible.

**THE WIRE USED FOR THE LOOPS MUST BE HEAT AND WATER RESISTANT. CROSS-LINK POLYETHYLENE INSULATED, TYPE XLPE OR RHW IS BEST. U.S.E. IS ALSO SATISFACTORY. DO NOT USE PVC INSULATED WIRE. WIRE SIZE SHOULD BE #16 GA STRANDED OR LARGE.**

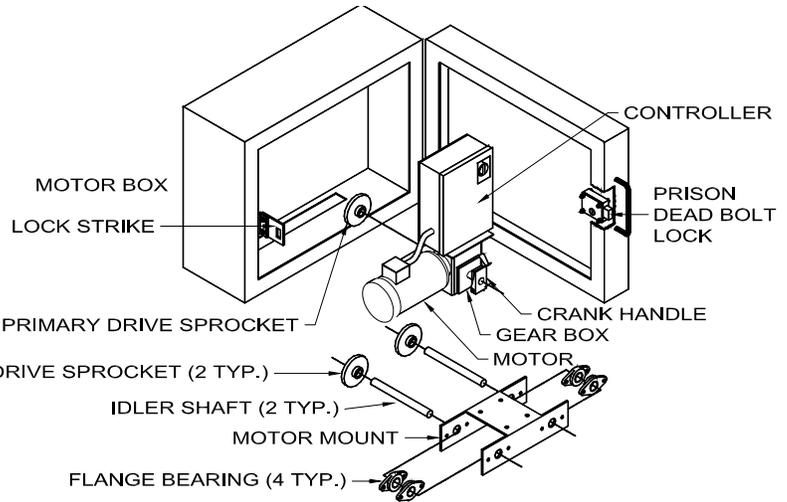
# 8 | C: INSTALLING THE OPERATOR



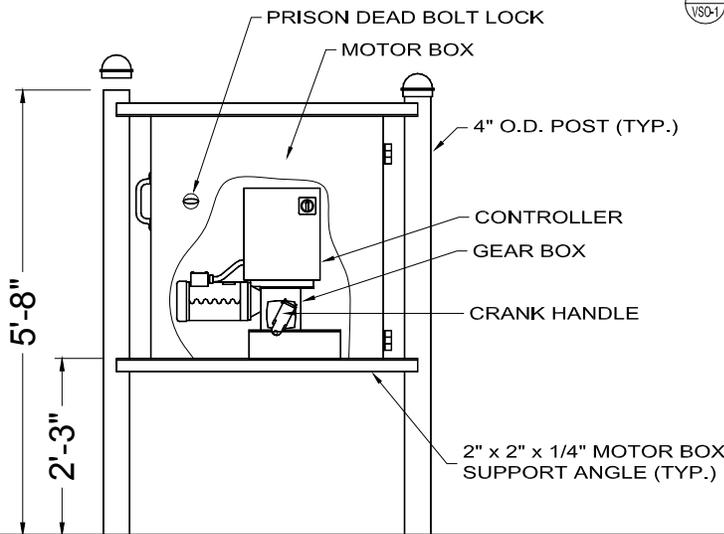
Figure 6: Operator Mounting Plan and Elevation Views



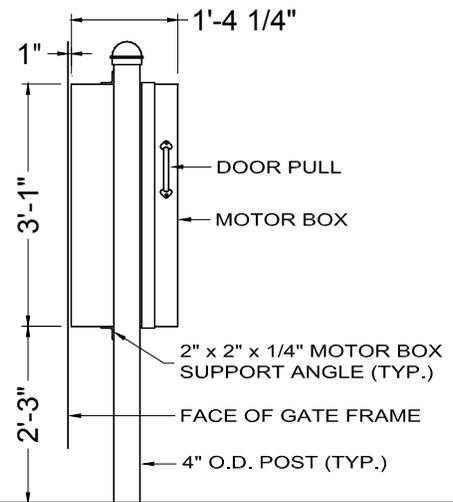
1 OPERATOR PLAN  
Scale: None



2 OPERATOR DRIVE ASSEMBLY  
Scale: None



3 OPERATOR FRONT ELEVATION  
Scale: None



4 OPERATOR SIDE ELEVATION  
Scale: None

## MOUNTING THE TYM-VariSpeed OPERATOR

The following instructions are applicable for standard mounting on a double post set of the 225VS gate operator (refer to the operator installation drawing of Figures 6 above and 6b and 6c on page 9.

After completing the gate installation, place the operator mounting posts at the appropriate location as shown on Figure 6 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 6b.

From the center of the slot in the bracket, run a string line taugth 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 6c. 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.

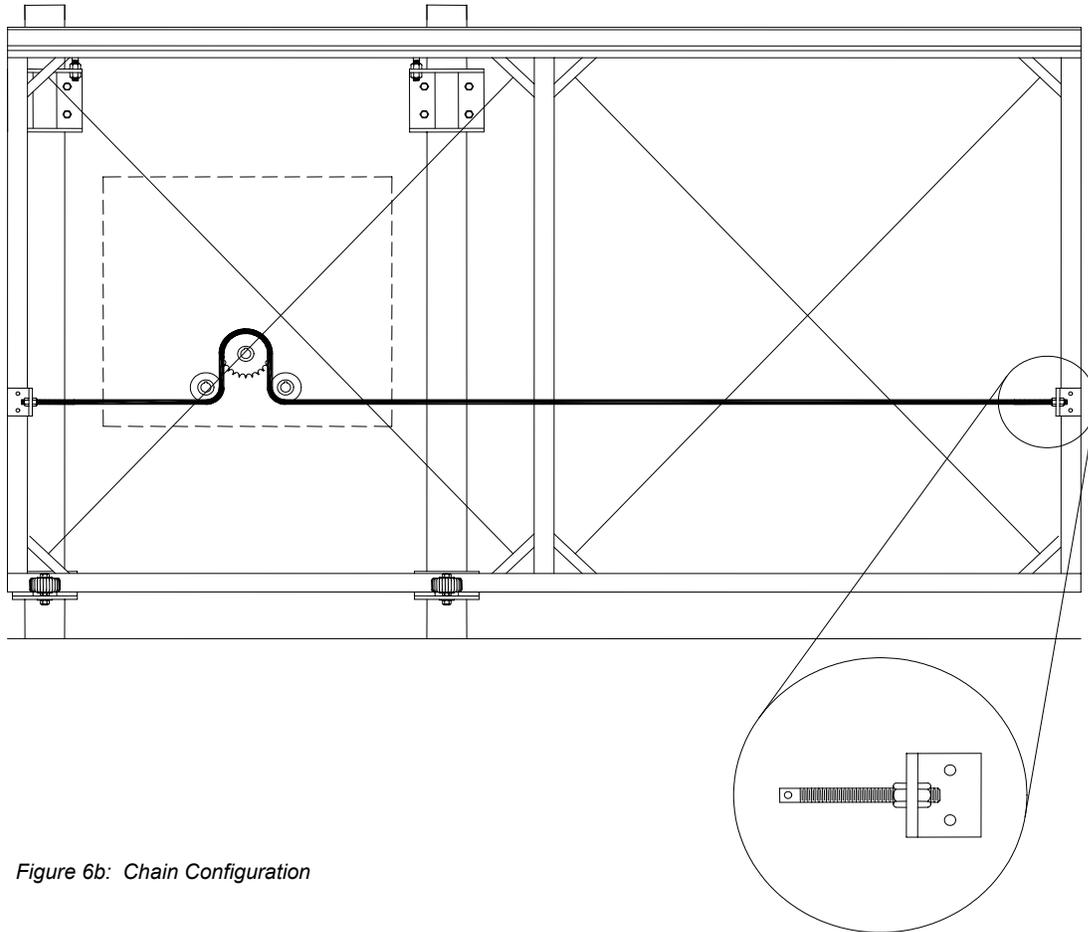


Figure 6b: Chain Configuration

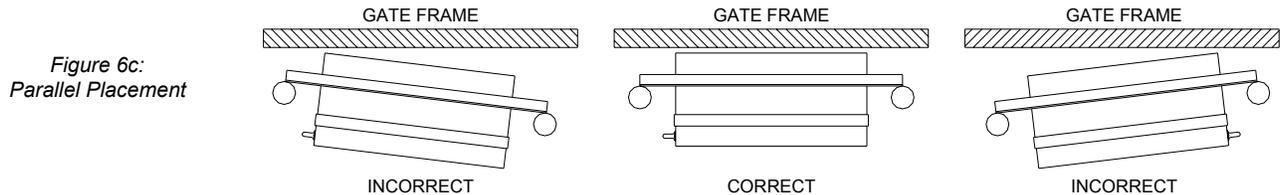


Figure 6c: Parallel Placement

### ENTRAPMENT PROTECTION DEVICES AND ACCESSORY EQUIPMENT HOOK-UP

**IMPORTANT - remove power from the operator before attempting to connect an accessory device or control station.**

All entrapment protection devices and accessory equipment are wired to the 22-terminal strip located on the bottom panel of the control box. See Figure 7. **SPACE CONSTRAINTS PROHIBIT ACCESSORY EQUIPMENT FROM BEING INSTALLED IN THE CONTROL BOX!** Install accessory equipment in an appropriate electrical box.

The Normally Open command inputs (Open, Close, etc. and the normally open entrapment protection inputs) for the TYM-VariSpeed require a switch closure to COMMON of less than 100 OHMS resistance and for more than 100 milliseconds duration. The Alternate input is a momentary input where the signal must be released and re-entered to be recognized. The remaining inputs (STOP, the normally closed (NC) entrapment protection, and Terminal 11 REVERSING NC inputs) must be continuous signals (an electrical closure to COMMON of less than 100 OHMS resistance. The Reference Chart on Page 12 lists the function of each of the terminals on the terminal strip. There are 7 (seven) discrete contact output terminals (nos. 14

thru 20) to allow for control of external devices as appropriate (i.e. gate at open and close position indicators, gate in motion etc.). PLEASE NOTE as previously stated that a REVERSING NC input to Terminal #11 must be Normally Closed.

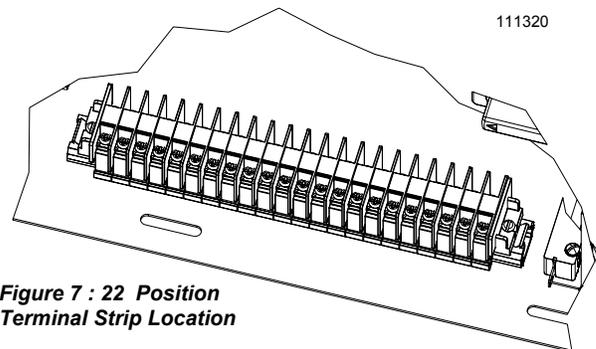
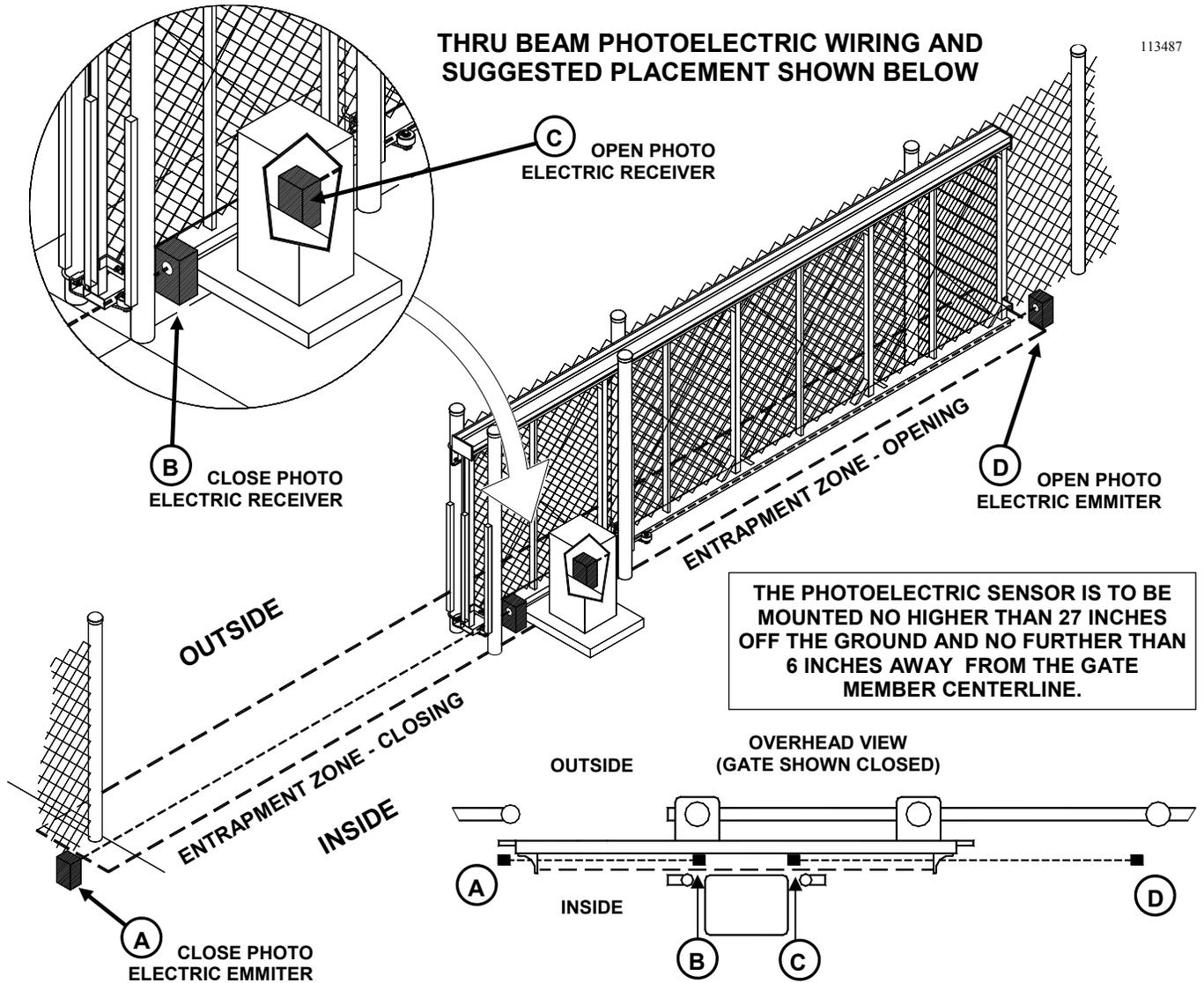


Figure 7 : 22 Position Terminal Strip Location

# 10 | C: INSTALLING THE OPERATOR

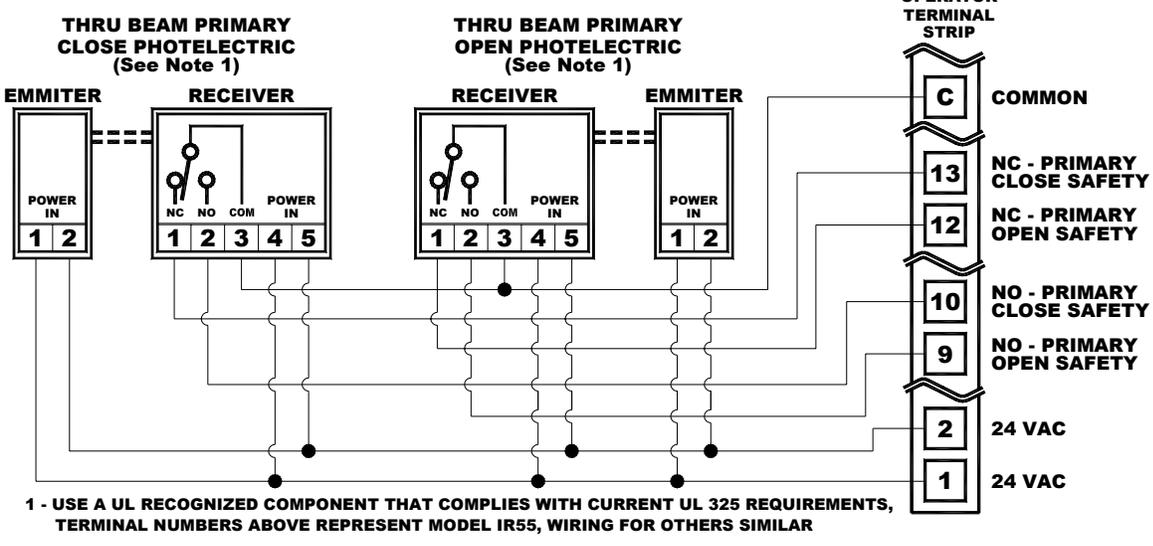


## WIRING AND SUGGESTED PLACEMENT OF NON-CONTACT SENSOR (PHOTOELECTRIC) SECONDARY ENTRAPMENT PROTECTION DEVICES - See Note at Lower Left



113487

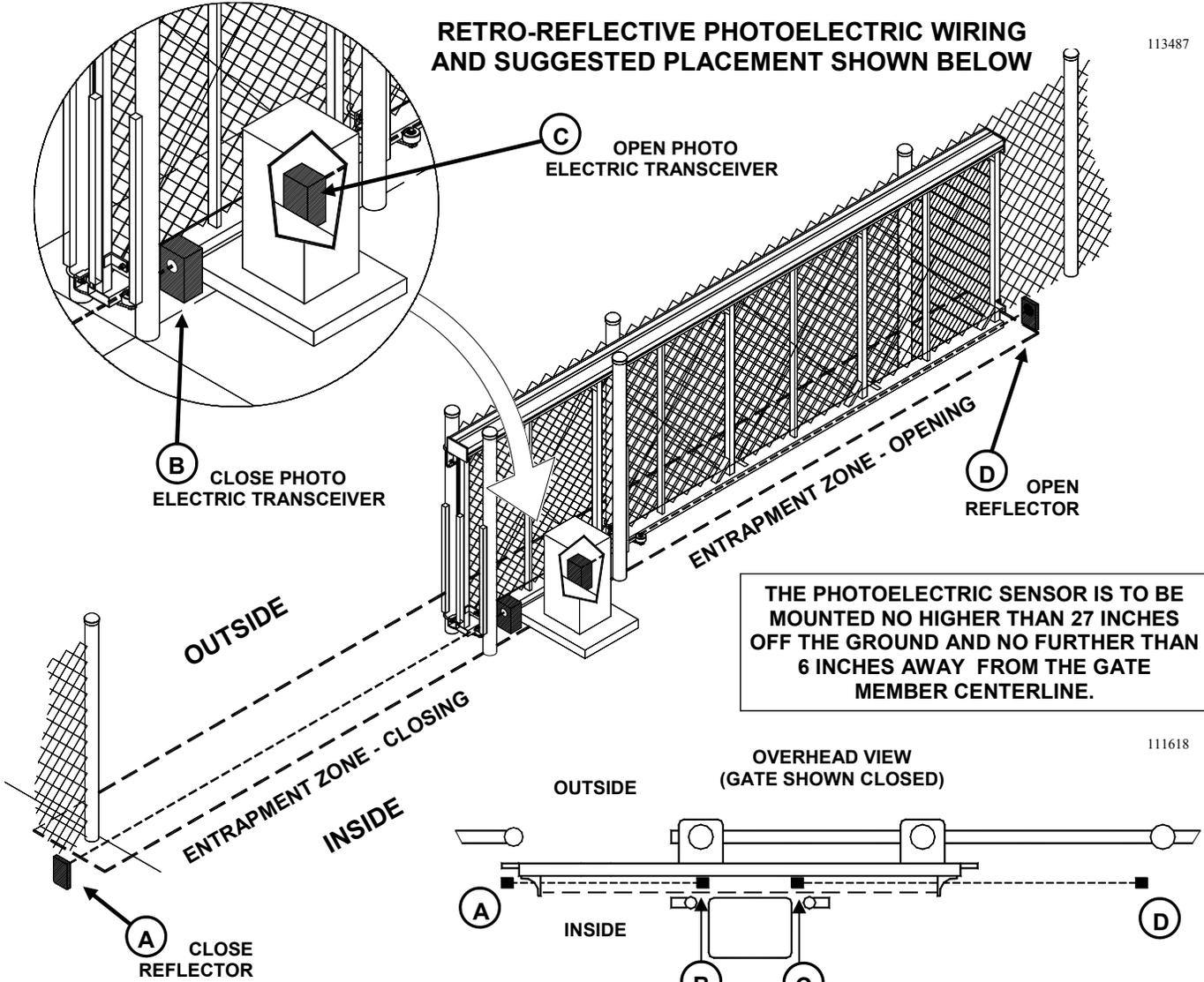
**Note:** For Class III operation two (2) photoelectric devices as described on pages 10 and 11 must be connected as shown, one for closing and one for opening. These devices are optional for Class IV operation. Test these devices once a month.



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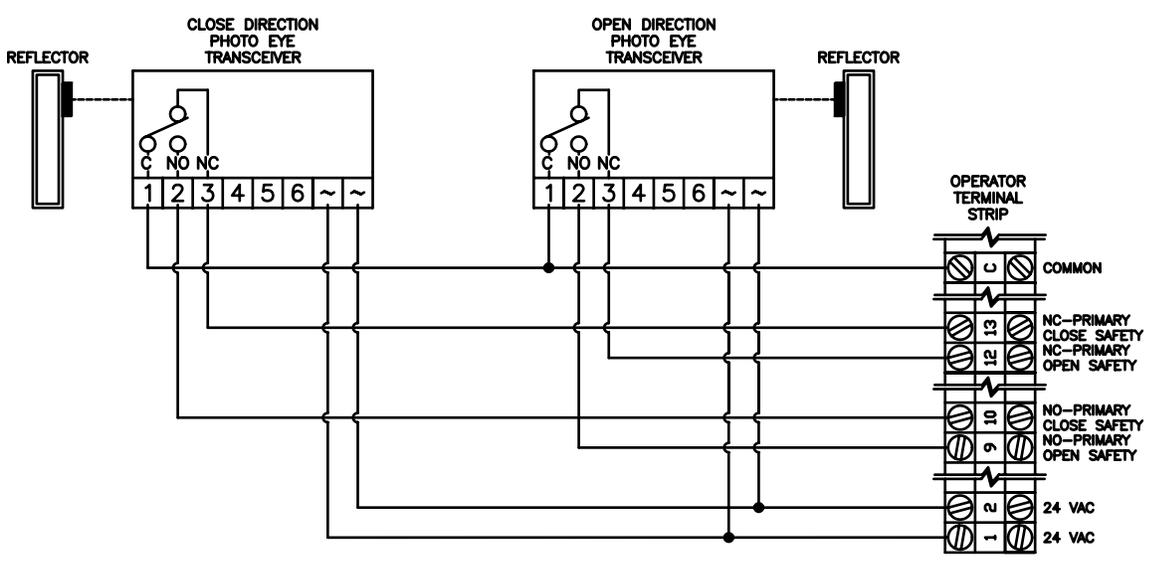
## WIRING AND SUGGESTED PLACEMENT OF NON-CONTACT SENSOR (PHOTOELECTRIC) SECONDARY ENTRAPMENT PROTECTION DEVICES - See Note at Lower Left



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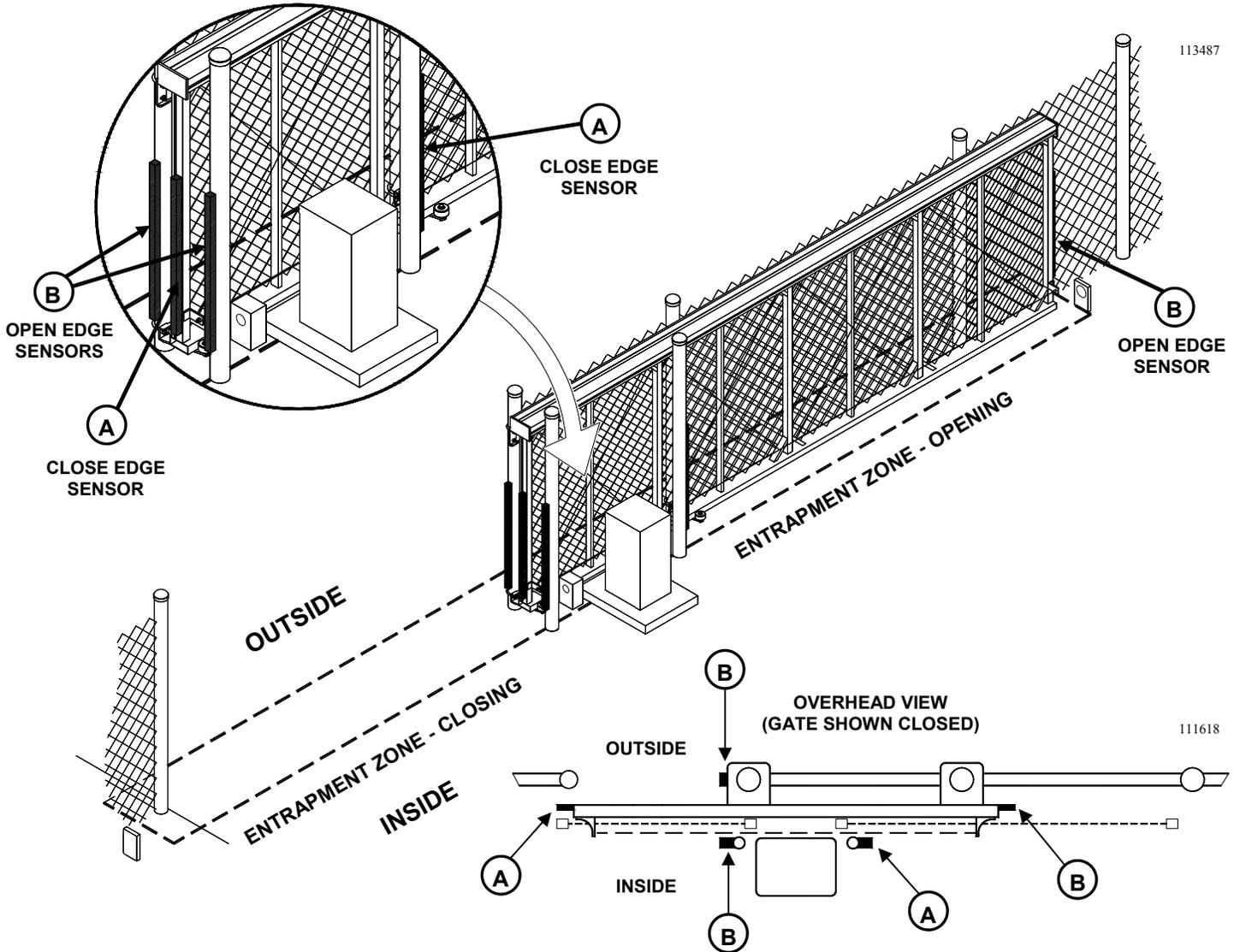
**Note: For Class III operation two (2) photoelectric devices as described on pages 10 and 11 must be connected as shown, one for closing and one for opening. These devices are optional for Class IV operation. Test these devices once a month.**



# 12 | C: INSTALLING THE OPERATOR



## WIRING AND SUGGESTED PLACEMENT OF OPTIONAL CONTACT SENSOR (ELECTRIC EDGE) SECONDARY ENTRAPMENT PROTECTION DEVICES

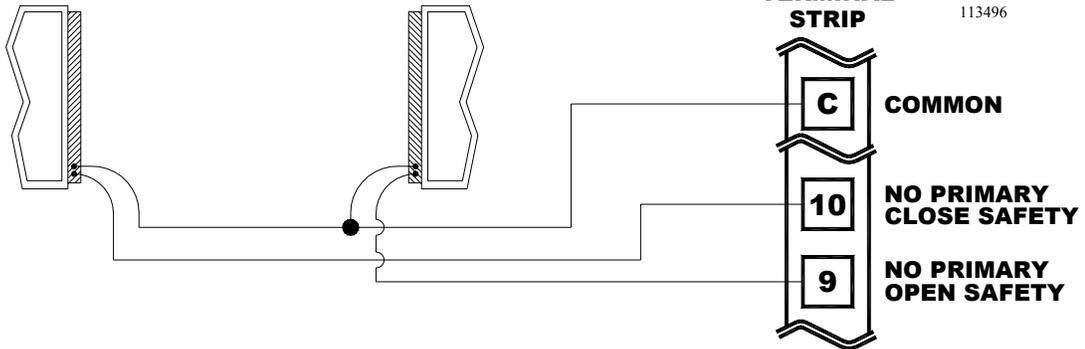


**CLOSE EDGE SENSOR(S)**  
(SEE NOTES 1 & 3)

**OPEN EDGE SENSOR(S)**  
(SEE NOTES 1 & 3)

**OPERATOR TERMINAL STRIP**

113496



- 1 - USE A UL RECOGNIZED COMPONENT THAT COMPLIES WITH CURRENT UL 325 REQUIREMENTS, AN EDGE SENSOR THAT ACTIVATES ON THREE (3) SIDES SHOULD BE USED
- 2 - MULTIPLE EDGE SENSORS MAY BE CONNECTED IN PARALLEL



## WIRING THE VEHICLE DETECTOR(S) TO THE GATE OPERATOR

NOTE: INSTALLATION STEPS DETAILED IN SECTIONS A, B, C AND D MUST BE COMPLETE BEFORE WIRING IN THE VEHICLE LOOP DETECTOR(S). The wiring instructions are placed here for sake of continuity with the subject matter.

Place the detector in a remote electrical box. Hook-up the power and loop wires on the detector harness according to the manufacturer's instructions. For a Reversing Loop, The RELAY COMMON wire is connected to one of the COMMON (C) terminals on the control box 22 position terminal strip. The Normally Closed PRESENCE OUTPUT wire is connected to terminal #11, REVERSE. For a Free Exit Loop, The RELAY COMMON wire is connected to one of the COMMON (C) terminals on the control box 22 position terminal strip. The Normally Open PRESENCE OUTPUT wire is connected to terminal #5, Free Exit Loop. See Figure 8 at right above for a typical wiring installation.

Set the vehicle detector frequency and sensitivity switches on the detector according to the manufacturer's instructions.

## WIRING A RADIO RECEIVER

Radio receivers must be of the 4-wire connection hook-up type (where the power input for the receiver is separate from the receiver's output connection). This is necessary as the TYM-VariSpeed control board 24 VAC is isolated from chassis ground. A 3-prong receiver CANNOT be installed in association with the TYM-VariSpeed control board.

Connect the receiver's two wires for power to terminals #1 and 2 (24 VAC). Connect one of the two wires for the radio relay to terminal #3 (ALTERNATE) or to terminal 4 (Radio Open) and the other wire to one of the COMMON (C) terminals on the TYM-VariSpeed terminal strip. Connection to terminal 3 or 4 is determined based on the Class restrictions and operation characteristics as defined below:

**Terminal 4 - Radio Input** - Momentary contact for Class III installations. This input cannot be used for Class IV installations. Activation will cause a closed or partially open gate to fully open. Activation while the gate is closing will cause it to reopen. Activation has no effect on a fully open gate.

**Terminal 3 - Alternate** - Momentary contact for Class III installations and constant contact for Class IV installations. Connect appropriate access control devices to this terminal and terminal (C) COMMON. Activation stops a moving gate. For Class III installations, sequential operation will change the direction of gate movement. For example: Open, Stop, Close, Stop, etc. For Class IV installations the gate will stop when released and the next activation changes the direction of travel.

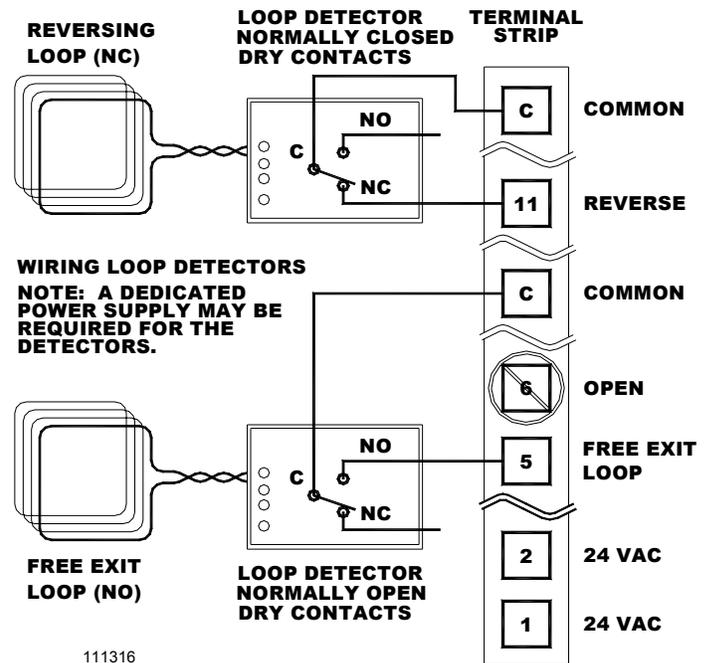


Figure 8: Wiring A Reversing Loop Detector

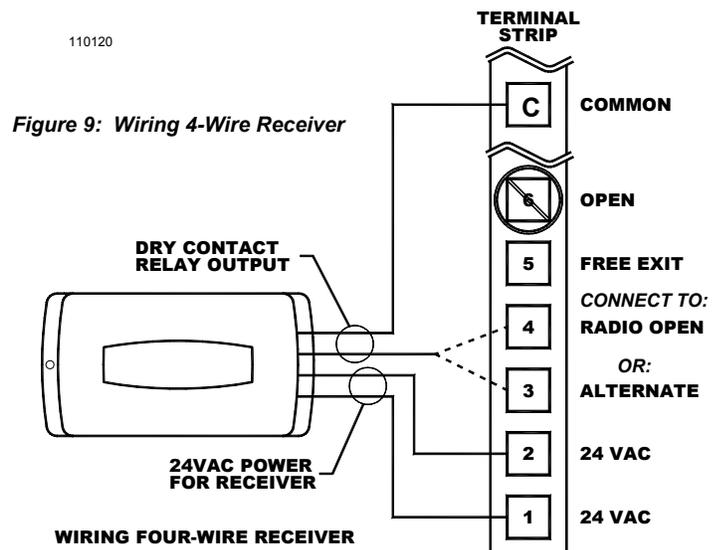


Figure 9: Wiring 4-Wire Receiver



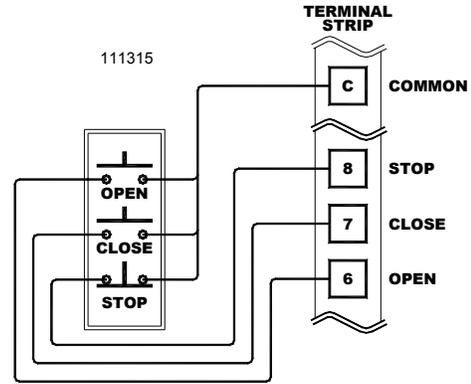
## WARNING!

**RISK OF ENTRAPMENT!**  
**TO REDUCE THE RISK OF INJURY OR DEATH:** Locate a keypad, card reader, key switch or similar entry devices in locations where a user can not reach through the gate or fence to activate the gate operator. The recommended distance between the gate or fence and an accessory device is 10 feet.

### WIRING A THREE BUTTON STATION

See Figure 10 for instructions on wiring a 3-button station.

**NOTE:** As previously stated, the STOP button is Normally Closed.

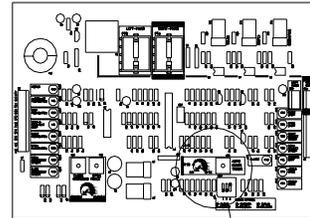


**WIRING 3-BUTTON STATION WITH NORMALLY CLOSED STOP**

**Figure 10 : 3 Button Station Wiring**

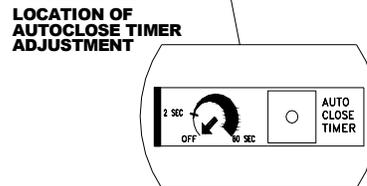
### TIMER TO CLOSE SETTING

The Timer to Close is controlled by the setting of the “AUTO CLOSE TIMER” potentiometer on the control board, see Figure 11. When the pot is adjusted fully counter-clockwise the Timer-To-Close is disabled. Turning the pot approximately 1/4 turn clockwise will enable the Timer-To-Close function and the gate will automatically close (after a delay of approximately 2 seconds) between the gate stopping at the full open position and *any* partially open position. To increase the time delay continue to turn the pot in the clockwise direction to a maximum delay of 60 seconds (one minute). The Timer-to-Close will not automatically close a gate that has reversed and stopped due to an obstruction reversal, only if the gate was stopped via a manual input. **PLEASE NOTE:** the Timer-To-Close feature is automatically disabled for Class IV installations (when the operator does not detect the presence of the external entrapment protection device and the control then operates in a Constant Contact mode).



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**Figure 11 : Location of Auto-Close Timer Adjustment**



**LOCATION OF AUTOCLOSE TIMER ADJUSTMENT**

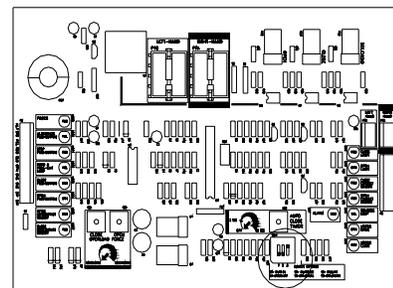
### SETTING THE SWITCH SELECTABLE OPTIONS

**SWITCH #1 - GATE INTERLOCK OPTION:** When Switch #1 is ON, the Alternate input becomes an Interlock input that may be used with an external lock (see Solenoid Relay Output, Terminal Strip Reference Chart, page 17). When the gate is at the close limit and receives an Open Command, the gate will not start to open until the Alternate input is sequentially activated also. After the Alternate input is activated, the Solenoid Relay output is activated and the gate then begins to open. If the Interlock input (Alternate) is not activated within 10 seconds from receiving an open command, the open function is terminated. Once the close limit is inactive (limit nut has moved away from the limit switch), the interlock input is ignored.

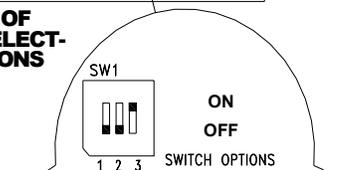
**SWITCH #2 - FULL REVERSE OPTION:** When Switch #2 is OFF and an obstruction is detected, the gate will stop, pause, reverse a few inches and stop. When Switch #2 is ON and an obstruction is detected, the gate will stop, pause, reverse to the opposite direction and continue to run to the limit position unless another obstruction is detected. When Switch #2 is ON and the gate is in the process of reversal due to an obstruction and the gate detects another obstruction, the gate will stop and the onboard alarm will sound. A manual control via the open, close, or stop input is required to reset the alarm and the gate operator then requires constant pressure on the control until a limit is reached. This mode of operation (switch #2 ON) is only recommended when using non-contact obstruction detection devices such as photo-beams devices.

**Figure 12: Switch Selectable Options**

110126



**LOCATION OF SWITCH SELECTABLE OPTIONS**



**SWITCH #3 - TIMER TO CLOSE DISABLE:** When Switch #3 is ON, the automatic Timer-To-Close is disabled regardless of the position of the adjustment potentiometer. A Service Technician may use this switch to disable the timer function without disturbing the setting of the adjustment potentiometer.



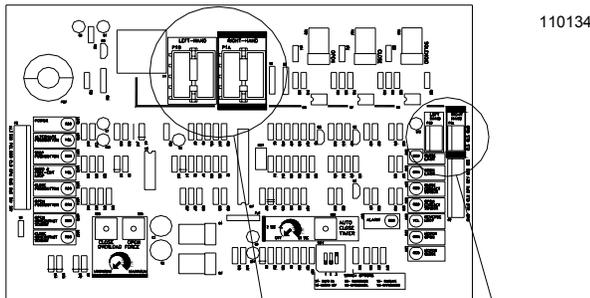
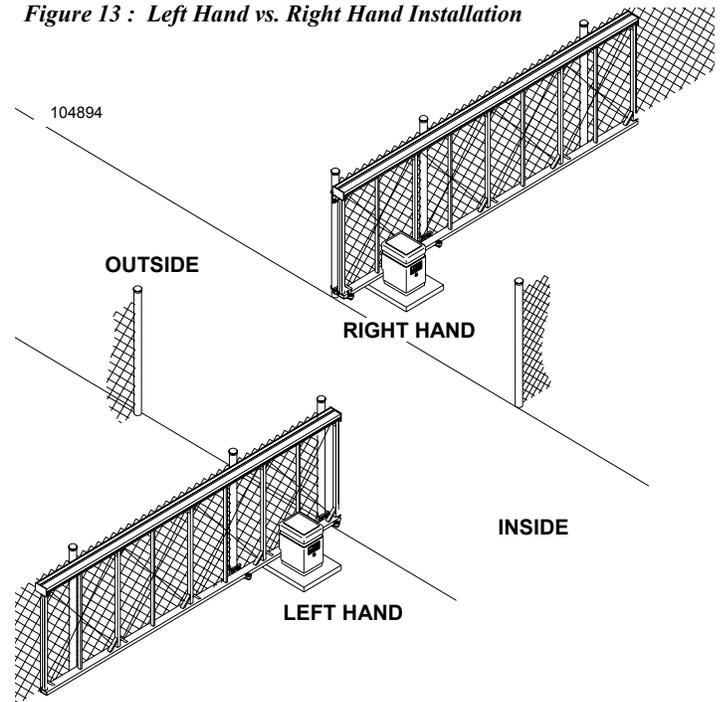
## LEFT- OR RIGHT-HAND INSTALLATIONS

The TYM-VariSpeed operator can be configured for left- or right-hand gate installations. See Figure 13. On a normal drive installation, when standing inside the gate and facing outwards, if the operator is on the right side of the gate opening, it's a right-hand installation. If the operator is on the left side of the gate opening, it's a left-hand installation.

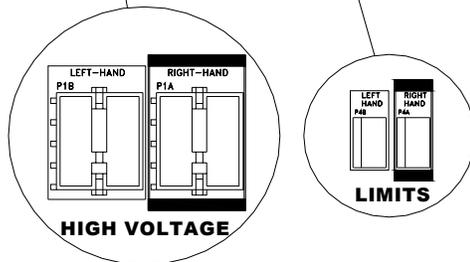
The operator is shipped from the factory configured for right-hand installations. If it is installed in a left-hand installation, make sure the main power switch is off and locate the 8-pin, motor wire connector in the upper center of the controller board. See Figure 14.

Pinch the locking tabs on the two sides of the connector and remove it from the connector labeled, "RIGHT-HAND". Then plug it into the connector labeled, "LEFT-HAND". Locate the 3 position limit switch wire harness connector midway down on the right side of the controller board. Switch it to the position labeled, "LEFT-HAND". The operator is now configured for a left-hand installation.

Figure 13 : Left Hand vs. Right Hand Installation



### LOCATION OF RIGHT-HAND & LEFT HAND HARNESS CONNECTIONS



**! WARNING!**

The motor wire connector and the limit wire connector must both always be in either the right or left positions. If one is in the right position and the other in the left position, the operator will not stop the gate when it reaches the end of travel.

Figure 14: Control Board Settings for LH/RH Operation

## SMART™ SETTING - SELF ADJUSTING MAXIMUM RUN TIMER

The TYM-VariSpeed is equipped with a Self adjusting **MAXimum Run Timer**, SMART™, that will turn the TYM-VariSpeed OFF if a Limit Switch command is not received within a few seconds of the time required to fully Open or Close the gate. Valid commands received during the cycle, such a new input command, will automatically reset and restart the MRT.

To set the SMART™ Maximum Run Time and check that the limits are properly adjusted, fully open and close the gate five (5) times. The control board will sense the time required and add approximately two seconds.



## SETTING THE LIMIT and RAMP UP / RAMP DOWN SWITCHES

Before turning on the main power, set the limit switches for proper gate travel. The limit assembly is located at the bottom right side, inside the control box. See Figure 15. In a right-hand installation, the switch nearest the front of the control box is the open limit switch. In a left-hand installation, the switch farthest from the front of the control panel is the open limit switch.

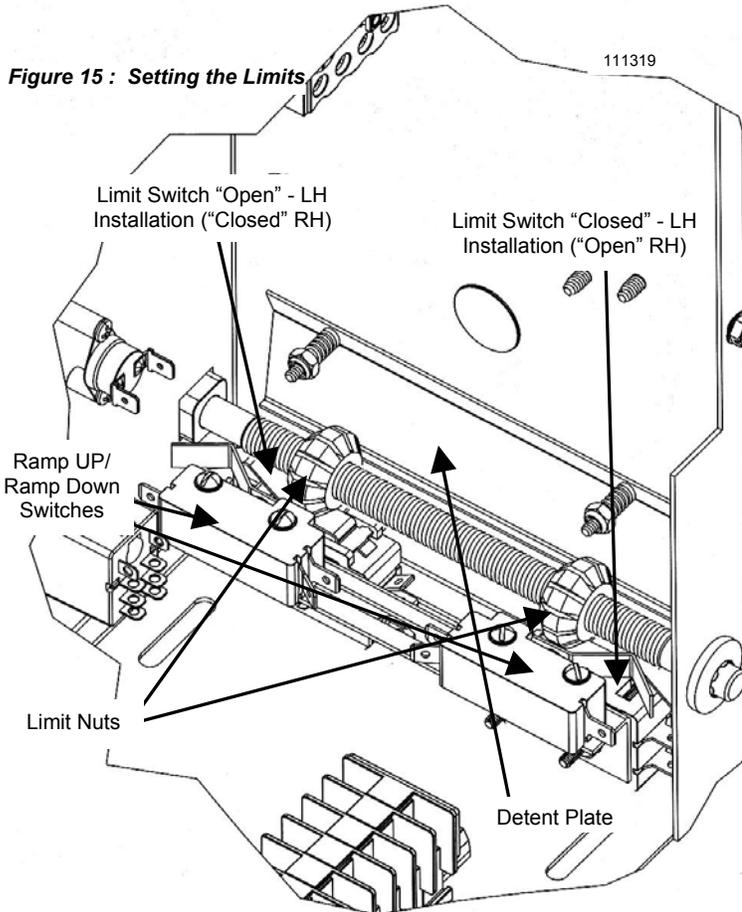


Figure 15 : Setting the Limits

Engage the manual operation (see Page 20) and move the gate all the way open. Press down on the spring loaded detent plate and rotate the open limit nut toward the open limit switches until you hear the switches click three times (the auxiliary switch will click once and the

larger limit switch will click twice). Rotate the limit nut two more slots to give the operator time to stop the gate after the limit switch has been activated. Release the detent plate and make sure it engages into the slots on both limit nuts.

Manually move the gate all the way closed. Depress the detent plate and rotate the close limit nut clockwise until the limit switches click three times (as above, the auxiliary switch will click once and the larger limit switch will click twice). Again rotate the close limit nut two more slots. Release the detent plate and make sure both limit nuts are firmly seated.

The limit switches are now roughly adjusted. If the gate should stop short of fully opened or closed, or if it bangs against the end stops during operation, the limit switches can be fine-tuned after the operator is powered up. (See FINAL SETTING OF THE LIMIT SWITCHES, below).

### FINAL SETTING OF THE LIMIT SWITCHES

If the gate stops short of being fully open or closed or if it bangs against the end stops, turn off the main power and reset the appropriate limit switch nut. Each slot on the limit nuts represents about xx" of gate travel. The nuts should only have to be turned one or two slots in either direction to fine tune the gate's limits of travel. When final adjustment has been completed, insure that the detent plate is firmly seated in the slots. Review Figure 15 on this page.

### RAMP DOWN SWITCH ADJUSTMENT

Switches are provided to activate the ramp down function to take the inertial out of the moving gate system. Loosen the mounting screws and slide the switches to adjust the setting of the ramp down speed change. Moving the switches toward the box center (closer to each other) increases the slow speed travel distance after ramp down. Approximately 2" of visible slow speed operation is all that is required to minimize gate cycle times. Slow speed travel distance at startup will be considerably longer than at ramp down based on the weight of the gate. Ensure the screws are tight once the desired ramp down setting is achieved.



## WARNING

**Shock Hazard: Electrical service for auxiliary devices may be routed through the Limit Switches. Even if power is OFF at the operator disconnect switch there may be voltage present at the Limit Switch terminals. Follow all local electrical codes and the National Electrical Code when wiring.**

### FINAL INSTALLATION CHECKLIST

1. Use a voltmeter to assure the service voltage to the operator is correct (consult the unit product label). Connection to the improper voltage is the most common cause of operator component failure in new installations and is NOT COVERED BY WARRANTY!
2. No accessory equipment is installed in the control box.
3. All wires attached to the 22 position terminal strip or the 3-terminal connector on the control box are well clear of the moving parts associated with the limit assembly.
4. The control box cover is securely fastened .



# D: STARTING THE OPERATOR / 17

TERMIN

#	NAME	DESCRIPTION
1	24 VAC	Provides maximum 40 VA auxiliary power for accessories.
2	24 VAC	24 Volts @ 1.67 Amps Max.
3	<b>ALTERNATE * - NORMALLY OPEN</b>	Momentary contact for Class III installations and constant contact for Class IV installations.
<p>Connect appropriate access control devices to this terminal and terminal (C) COMMON. Activation stops a moving gate. For Class III installations, sequential operation will change the direction of gate movement. For example: Open, Stop, Close, Stop, etc. For Class IV installations the gate will stop when released and the next activation changes the direction of travel.</p>		
4	<b>RADIO INPUT - NORMALLY OPEN</b>	Momentary contact for Class III installations. This input cannot be used for Class IV installations.
<p>Activation will cause a closed or partially open gate to fully open. Activation while the gate is closing will cause it to reopen. Activation has no effect on a fully open gate.</p>		
5	<b>FREE EXIT LOOP - NORMALLY OPEN</b>	Momentary contact for activation and the input does recognize constant contact (see below). Class III installations. This input cannot be used for Class IV installations.
<p>Activation will cause a closed or partially open gate to fully open. Activation while the gate is closing will cause the gate to reopen. Continuous activation will prevent the Timer-To-Close function from automatically closing the gate.</p>		
6	<b>OPEN - NORMALLY OPEN</b>	Momentary contact for Class III installations and constant contact for Class IV installations.
<p>For Class III installations, activation will start the gate open or cause a closing gate to stop and open. Continuous activation will prevent the timer to close from automatically closing the gate. For Class IV installations the gate will stop when released. For Class III or Class IV installations, continuous activation overrides the alternate and close commands.</p>		
7	<b>CLOSE - NORMALLY OPEN</b>	Momentary contact for Class III installations and constant contact for Class IV installations.
<p>For Class III installations, activation will start the gate close or cause an opening gate to stop and close. For Class IV installations the gate will stop when released.</p>		
8	<b>STOP - NORMALLY CLOSED</b>	Momentary contact for Class III and Class IV installations. Overrides all other signals.
<p>Once activated the gate will immediately stop and wait for a new command. If continuously activated the gate will not move.</p>		

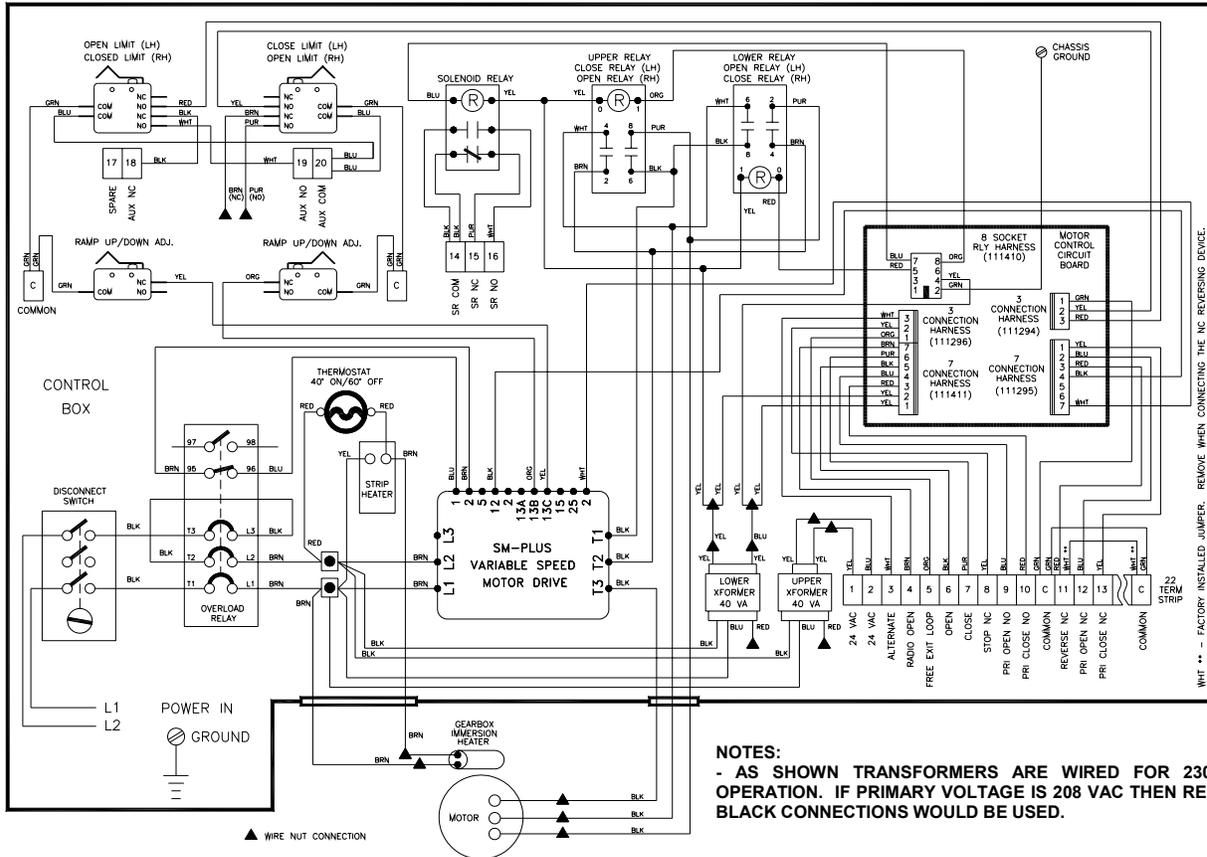
\* The descriptions above outline how the gate reacts with the Switch Selectable Option Switches (page 14) in the OFF positions. Please review "Setting The Switch Selectable Options" section on the bottom of page 14 for a full description of the gate reacts when the switches are set to the ON position.

#	NAME	DESCRIPTION
9	<b>PRIMARY OPEN SAFETY INPUT * - Normally Open</b>	
12	<b>PRIMARY OPEN SAFETY INPUT * - Normally Closed</b>	
<p>These inputs are only active when the gate is moving open. The device dedicated to providing primary entrapment protection in the open direction is connected to these inputs. The device must have both a normally open and normally closed output when the device is operating properly. When the device detects an obstruction or is not working properly, it must change the state of its outputs. If activated when the gate is moving open the gate will stop and reverse direction for approximately 4 seconds.</p>		
10	<b>PRIMARY CLOSE SAFETY INPUT * - Normally Open</b>	
13	<b>PRIMARY CLOSE SAFETY INPUT * - Normally Closed</b>	
<p>These inputs are only active when the gate is moving close. The device dedicated to providing primary entrapment protection in the close direction is connected to these inputs. The device must have both a normally open and normally closed output when the device is operating properly. When the device detects an obstruction or is not working properly, it must change the state of its outputs. If activated when the gate is moving closed the gate will stop and reverse direction for approximately 4 seconds.</p>		
11	<b>REVERSING DEVICE INPUT - Normally Closed</b>	
<p>This input is only active when the gate is moving close. The device must have a normally closed output when the device is operating properly. The output changes states to an open condition when power is removed or an obstruction is detected. If activated when the gate is moving closed the gate will stop and reverse direction and continue to the full open position.</p>		
14	<b>SOLENOID RELAY OUTPUT - Common</b>	
15	<b>SOLENOID RELAY OUTPUT - Normally Closed</b>	
16	<b>SOLENOID RELAY OUTPUT - Normally Open</b>	
<p>This output can be used to power an external lock mechanism. When the gate is at the close limit and input is given to start an open function the relay is activated (changes states) until the gate moves off the close limit switch. Once the close limit is inactive, the relay is de-energized and the output returns to its normal state. The relay is not activated at any other time.</p>		
17	<b>SPARE</b>	
18	<b>AUX SWITCH NC - Normally Closed output of auxiliary</b>	
19	<b>AUX SWITCH NO - Normally Open output of auxiliary</b>	
20	<b>AUX SWITCH COM - Common output of auxiliary</b>	
<p>The position of the Auxiliary Switch is fixed and activates just prior to the Closed Limit (right hand installations). Provides a dry contact switch - maximum of 10 Amps @ 120 VAC and 5 Amps @ 230 VAC.</p>		
C	<b>COMMON</b>	
<p>There are two COMMON terminals, one placed between terminals 10 &amp; 11 and the other placed after terminal 20. The Command Inputs and the Safety device inputs must be connected to their individual terminals and the COMMON terminal.</p>		



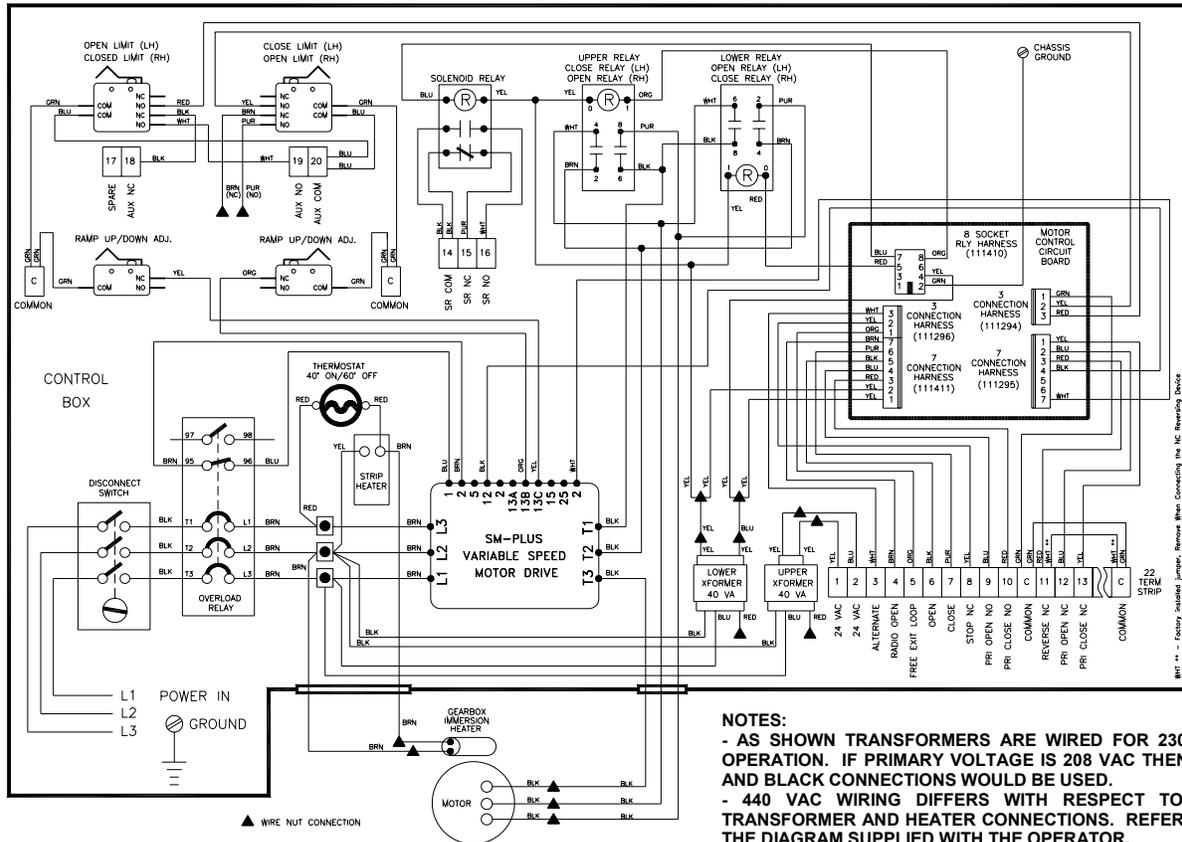
## 1 PHASE WIRING DIAGRAM

111305



## 3 PHASE WIRING DIAGRAM

111246





IMPORTANT SAFETY INSTRUCTIONS



**WARNING!**

**TO REDUCE THE RISK OF SEVERE INJURY OR DEATH**

1. READ AND FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS MANUAL.
2. Never let children operate or play with gate controls. Keep the remote control away from children.
3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensor. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release (if applicable on this operator) only when the gate is not moving.
6. **KEEP GATES PROPERLY MAINTAINED.** Read the owner's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.
8. **SAVE THESE INSTRUCTIONS.**

**NOTES**



### INITIAL POWER-UP CONSIDERATIONS

Long periods of storage in excess of 3 years

If input power has not been applied to the unit for over 3 years, the electrolytic DC bus capacitors of the Leeson Speedmaster Drive must be reformed by applying input power to the drive for 8 hours before actually operating the motor.

Below Freezing component temperatures

Frequency Drive unit requires an environment above 32 degrees F. If exposed to below freezing temperatures while being powered up, the following is required, otherwise non-warranted damage can result:

- ◆ Disconnect Input Power to Leeson Speedmaster Drive Unit

- ◆ Connect supply power to disconnect switch
- ◆ Apply power to the gate controller to bring the controls up to temperature
- ◆ Connect Input Power to Leeson Speedmaster Drive Unit for 8 hrs minimum without operating the motor.

High Moisture Conditions

Evidence of condensation as result of storage or the presence of water inside the galvanized box as result of improper storage will require the following, otherwise non-warranted damage can result:

- ◆ Follow steps for below freezing conditions above

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### BASIC OPERATIONAL GUIDE - CLASS III

- If the gate is fully closed an Open Button or Alternate input will cause the gate to begin moving in the open direction.
- If the gate is fully open a Close Button or Alternate input will cause the gate to begin moving in the close direction.
- If the gate is moving in a Close direction a Primary Close Normally Open or Normally Closed Sensor input will cause the gate to stop, pause and reverse for a minimum of 2 inches in the Open direction.
- If the gate is moving in a Close direction an Open Button or Reversing Loop input will cause the gate to stop, pause, reverse and run in the Open direction.
- If the gate is moving in a Close direction a Stop Button or Alternate input will cause the gate to stop. A subsequent Alternate input will cause the gate to begin moving in the Open direction.
- If the gate is moving in an Open direction a Primary Open Normally Open or Normally Closed Sensor input will cause the gate to stop, pause and reverse for a minimum of 2 inches in the Close direction.
- If the gate is moving in an Open direction a Stop or Alternate input will cause the gate to stop. A subsequent Alternate input will cause the gate to begin moving in the Close direction.
- In Class III operation, two sequential activations of the Primary Entrapment Sensors (Open or Close direction) before the gate reaches a limit will cause the operator to go into the alarm mode. To reset the operator remove the obstruction and either use constant pressure on a control button connected to the OPEN or CLOSE input and move the gate to a fully open or closed position or turn off and restore the power to the operator.

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### BASIC OPERATIONAL GUIDE - CLASS IV

- If the gate is fully closed an Open Button or Alternate input by holding constant pressure on the activation device will cause the gate to begin moving in the open direction.
- If the gate is fully open a Close Button or Alternate input by holding constant pressure on the activation device will cause the gate to begin moving in the close direction.
- If the gate is moving in a Close direction a Primary Close Normally Open or Normally Closed Sensor input will cause the gate to stop.
- If the gate is moving in a Close direction a removal of constant pressure on the activation device of a Close Button input will cause the gate to stop.
- If the gate is moving in a Close direction a removal of constant pressure on the activation device of an Alternate input will cause the gate to stop. A subsequent Alternate input by holding constant pressure on the activation device will cause the gate to begin moving in the Open direction.
- If the gate is moving in an Open direction a Primary Open Normally Open or Normally Closed Sensor input will cause the gate to stop.
- If the gate is moving in an Open direction a removal of constant pressure on the activation device of an Open Button input will cause the gate to stop.
- If the gate is moving in an Open direction a removal of constant pressure on the activation device of an Alternate input will cause the gate to stop. A subsequent Alternate input by holding constant pressure on the activation device will cause the gate to begin moving in the Close direction.

\* The descriptions above outline how the gate reacts with the Switch Selectable Option Switches (page 14) in the OFF positions. Please review "Setting The Switch Selectable Options" section on the bottom of page 14 for a full description of the gate reacts when the switches are set to the ON position.



### CLUTCH ADJUSTMENT AND MANUAL OPERATION

#### Gear Box 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 Fig. 16A) and using a hammer, gently tap the crank handle away from the gear box until the spacer rotates freely.
  - Tighten the pressure bolt.

If the gate frame weight is 2500 pounds or less:

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. See Fig. 16A.

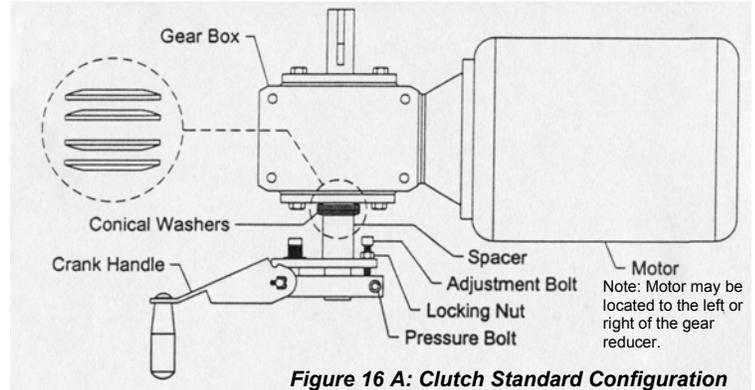


Figure 16 A: Clutch Standard Configuration

- **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.

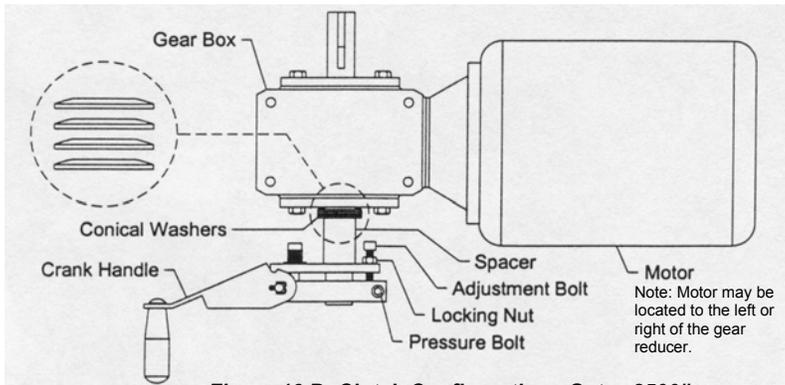


Figure 16 B: Clutch Configuration - Gates 2500#+

If the gate frame weight is greater than 2500 pounds:

- Unfold the crank handle, loosen the pressure bolt completely and remove the crank handle from its shaft. See Fig. 16B.
- Remove the spacer and the conical washers.
- Reconfigure the conical washers so that they are nestled within each other and in the same direction and replace on the shaft.
- Reassemble the crank handle on the shaft in reverse of immediate above and adjust the clutch as detailed above.

**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.**



### To the Owner/End User of TYMETAL's Gate Operator:

Thank you for choosing a TYMETAL product. We are confident you will have many years of use and satisfaction with your gate operator. As you review these safety guidelines refer to Figures 17 (below) and 18 (page 22).

Our Gate Operator is part of your unique gate operating system, which may consist of a variety of components, including the gate, the gate tracks, posts, and electronic features. These components combined present certain risks and safety issues of which you, the end user, must be aware.

Each unique system presents a unique set of hazards which we cannot possibly address individually. These instructions will help you to identify the potential risks and safety issues your gate operator system presents, and guide you as you make your system as safe as possible for everyone who uses it.

Your first step is to consider the intended use of the gate system, who will be using the gate system, and in what manner the system is installed. You should have a clear understanding of how often the gate will be opened, who will be opening it, whether children and the general public will be near the gate system, and how close the gate system is to public property. Once you have answered these questions, you are ready to decide what safety measures must be taken to prevent injury.

To minimize the risk of entrapment in your gate system, install the following safety features:

- Electric gate edges
- Enclosed tracks
- Vertical guard posts
- Protective screen mesh
- Photoelectric sensors
- Instructional and precautionary signs
- Covers for exposed rollers



**ALL APPROPRIATE SAFETY FEATURES MUST BE INCORPORATED INTO YOUR GATE SYSTEM.**

Each safety feature is a separate component in your gate system. Read and follow all instructions for each of the components of your unique system. **Ensure that all instructions for mechanical components, safety features and the TYMETAL Gate Operator are available for everyone who will be using your gate system.**

The two warning signs shipped with your Gate Operator (See Figure 4, Page 5 of this manual) must be installed in prominent positions on both sides of your gate. Keep them clean and legible.

Read and follow the safety points on this and the following page which present the basic guidelines for the safest operation of your gate operator system.

### SAVE THESE INSTRUCTIONS !

#### PRECAUTIONS FOR PEDESTRIAN TRAFFIC OR RESIDENTIAL AREAS



The internal operator overload sensor may not be adequate entrapment protection in all situations to prevent arm, leg, or hand injuries. Padded electric gate edges, roller guards, pneumatic gate edges, or photoelectric sensors are therefore necessary when automatic gates are used near pedestrian traffic. See the figure below. **Use of pedestrian walk gate is mandatory where there is nearby pedestrian traffic.**

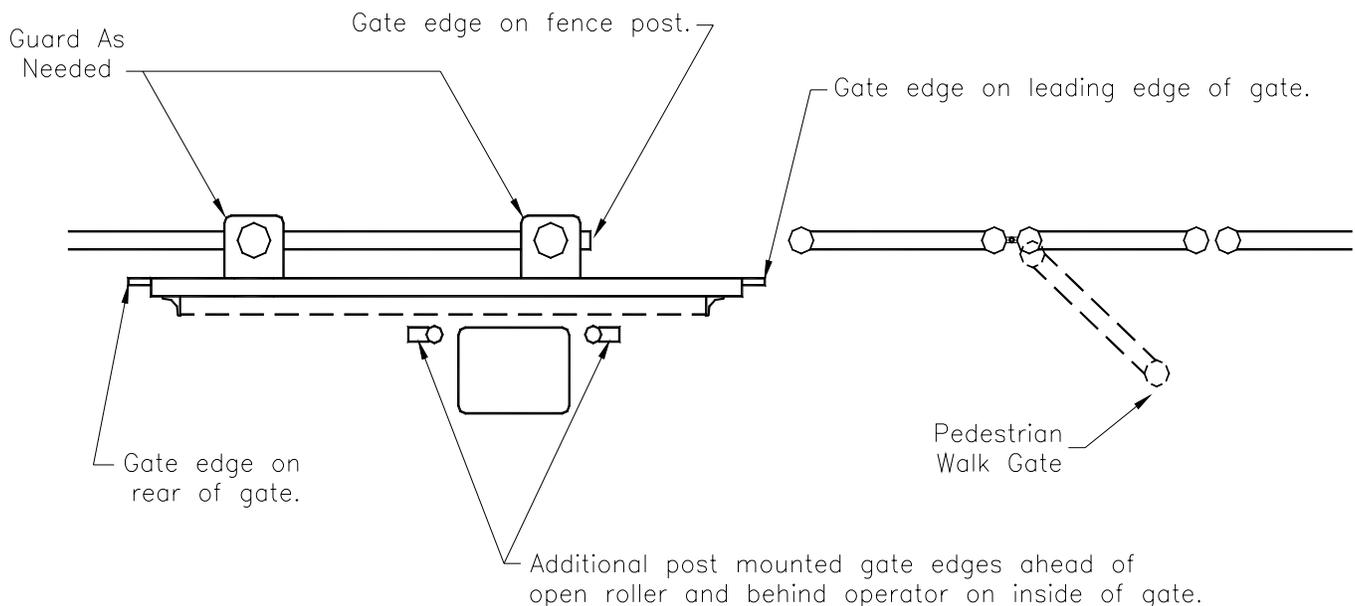


Figure 17: Entrapment Protection



**AVOID ENTRAPMENT:** Stay away from the path of the gate and all moving parts (gate arms, etc.) at all times. Keep clear of the pinch points identified below. Install guards or other safety features to prevent access to pinch point areas. Install guards on open

**NO CHILDREN OR PETS ALLOWED:** Never allow a child to operate gate controls, “ride” a gate, or play in the area of a gate. Install and store all controls out of children’s reach. Also, pets must be kept away from the gate. Install a pedestrian gate in applications where children or pets need access.

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

**LOCATE MANUAL CONTROLS SAFELY:** A manual control such as a pushbutton or keyswitch must be included in your gate system design to be used if automatic controls such as radio controls or loop detectors do not function. Carefully consider the placement of the manual control: It must be *out of reach of the gate* so that no one pushing the button or inserting the card is in the path of the gate or moving parts; it must also be *within sight of the gate* so that the operator can watch the gate and gate area during operation. **The recommended minimum distance between the gate or fence and manual control accessory is 10 feet.**

**INSTALL SAFETY DEVICES:** In residential applications or in areas where pedestrians may be present, or if your gate closes automatically, be sure an electric edge(s) and/or a photoelectric sensor(s) has (have) been installed and is/are operating properly. These features are intended to detect pedestrian traffic and prevent injury or entrapment. Loop detectors may be installed to detect vehicular traffic and prevent vehicular damage.

**MANUAL OPERATION** - The gate can be moved open or closed in case of power failure or other need to move the gate manually without disconnecting the operator chain. Remove power from the unit (if not already off) and firmly grasp the leading edge of the gate. Push or pull 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.

**PREVENT PERSONAL INJURY OR DEATH:** Do not stand near or on the gate. Gate may be activated without notice. Do not allow anyone to “ride” the gate, or place arms or legs through the gate. The force of the gate can cause serious personal injury or death. No one should cross the path of a moving gate.

**KEEP GATE IN SIGHT:** Never activate the gate unless it is in sight. Install mounted controls in full view of the gate. Be sure the gate area is clear before activating the gate, and watch the gate and gate area as the gate is in motion.

**MAINTAIN THE GATE AND GATE HARDWARE:** A damaged gate or one that cannot be easily opened and closed manually must be repaired before installing a gate operator. A poorly operating gate may cause the load sensing device of the operator to fail, causing a risk of entrapment. **Never overtighten the clutch or load sensing device to compensate for a poorly operating slide gate.** Correct all mechanical problems on the gate and gate hardware before installing the gate operator. Have a qualified service technician make repairs to the gate and gate hardware.

**MAINTAIN ALL COMPONENTS OF GATE SYSTEM:** Follow the maintenance instructions included with the gate, the gate operator, and the safety features and/or accessories that make up your gate operator system. Have a professional service technician perform any adjustments or maintenance to the components. **Fully test all safety features monthly. If faulty equipment is discovered or suspected, discontinue the use of the gate operator SYSTEM immediately, and have the equipment repaired or replaced by a qualified service technician.** The gate must reverse on contact with a solid, rigid object or when an object activates the non-contact sensors. After adjusting the force or limits of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.

## SAVE THESE INSTRUCTIONS !

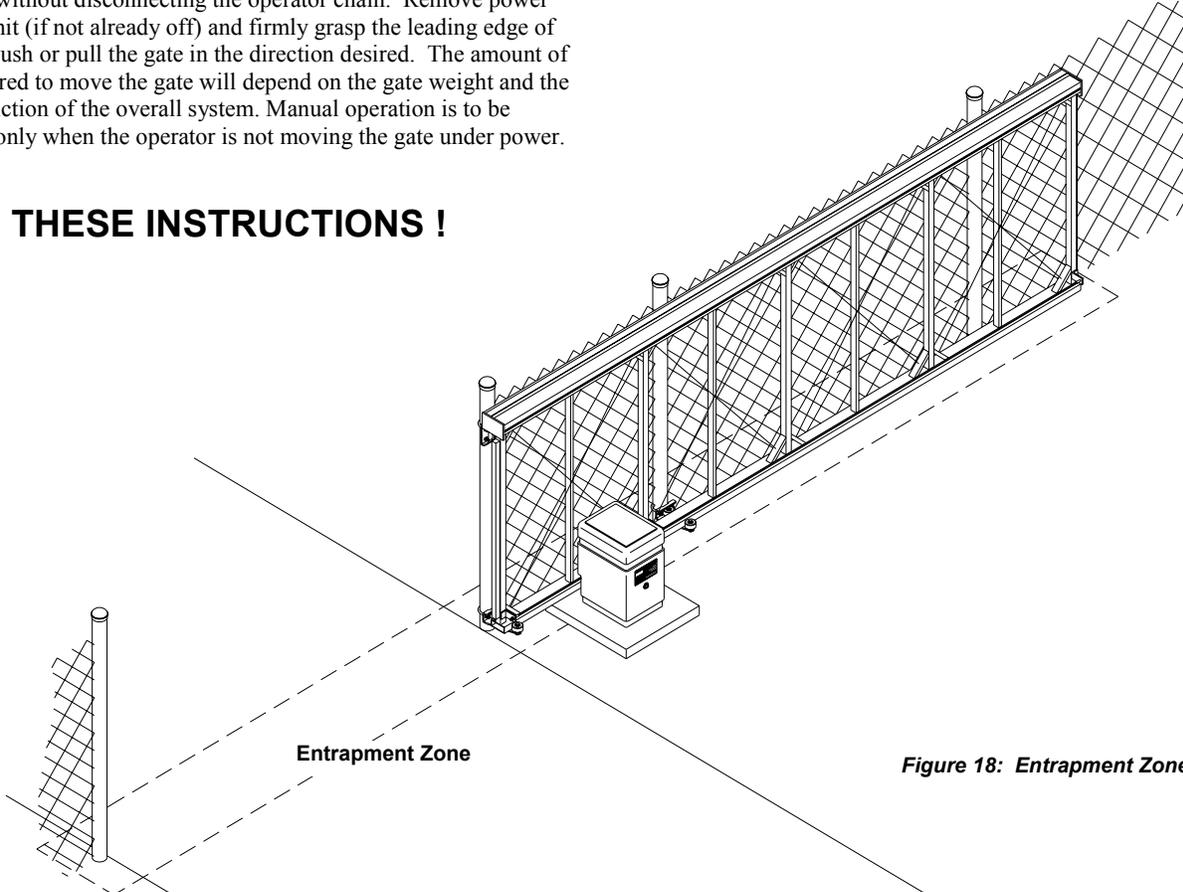


Figure 18: Entrapment Zone



It is recommended that the following maintenance be performed on the operator at a minimum (for high use installations (>100 cycles per day), steps noted below as monthly should be performed every 2 weeks):

√ Monthly - Check the function of all safety devices (photo-eyes, safety edges, etc.).

### 1. Photo eye inspection;

- Break the beam of the photo eye in the direction of gate travel. The gate should either stop then reverse for 2 seconds then stop or if programmed for second option reverse to full open or closed position.
- Clean the lenses on both photo eyes.
- Check mounting on both photo eyes- they should not move or vibrate.
- Check the alignment of photo eyes by shaking both photo eyes lightly. The photo beam should not break.

### 2. If the operator has reversing edges, they should be hooked to the reversing circuit (not the entrapment circuit).

- To test the edges compress the edge at the furthest point from the cable lead in.
- The gate should stop then reverse to the full reverse position. This should be tested on both directions of gate travel if so equipped. Check the mount of the reversing edge to verify the edge is not slipping down.
- Batteries should be replaced twice a year (be sure to write the date of replacement on the battery or cover).
- On the receiver for the edge, inspect the antenna mount (it must be isolated from grounding).

### 3. Check other traffic control devices for proper operation (loop detectors, traffic lighting, warning devices, etc.).

√ Monthly – Check the drive chain tension (maintain 1” to 2” sag maximum between chain support brackets). Tighten as necessary.

√ Monthly – Check the operation of the gate; it should operate smoothly and quietly back and forth. It should not bang into the receiver catcher and should not pinch the reversing edges. If so make the necessary adjustment (see Gate Installation Manual).

√ Monthly - Check the clutch for slippage and gearbox for oil level;

1. Check the clutch for proper adjustment - as the gate travels close, place medium force against the gate travel, if the gate pushes you away loosen the clutch, if the gate stops with little force tighten the clutch. See operator manual for adjustment of proper force.

2. Check the gearbox for oil leaks (visual check only).

√ Monthly - Inspect the electro-mechanical lock for operation and alignment. Adjust as necessary.

√ Monthly - Follow gate installation and maintenance manual for gate related tuning and adjustments (at a minimum check gate truck wheels and guide rollers for proper adjustment and wear, replacing if necessary).

√ Quarterly - Check for proper manual operator operation.

√ Quarterly – Check sprockets, limit switches and chain alignment;

1. Clean and lubricate the drive chain with a high grade chain & cable lube spray (do not lubricate the trucks or track area). Inspect drive sprocket and idler sprockets.

2. Sprockets should be in a straight line and should not be allowing the chain to rub on the motor cabinet. Check the set screws on flange bearings and sprockets for tightness.

3. Inspect limit drive chain. It should not be real tight or real loose. There should be about ¼ inch travel in chain.

√ Yearly - Check all wiring for integrity of insulation.

√ Yearly - Check the tightness of all electrical connections.

√ Yearly - Remove any foreign matter from the interior of unit.

### **Manufacturer's Limited Warranty**

TYMETAL warrants its gate operators to be free from defect in material and workmanship for a period of five (5) years from the date of purchase for single family home use and three (3) years from the date of purchase for multi-family and commercial use. This warranty covers all components except the electronic circuit boards which are warranted for three (3) years from the date of purchase for single family home use and two (2) years from the date of purchase for multi-family and commercial use. To obtain service contact your dealer.

To obtain service under this warranty the buyer must obtain authorization instructions for the return of any goods from TYMETAL before returning the goods. The goods must be returned with complete identification, with copy of proof-of-purchase, freight prepaid and in accordance with TYMETAL's instructions or they will not be accepted. In no event will TYMETAL be responsible for goods returned without proper authorization or identification.

Goods returned to TYMETAL for warranty repair within the warranty period, which upon receipt by TYMETAL are confirmed to be defective and covered by this limited warranty, will be repaired or replaced at TYMETAL's sole option, at no cost and returned pre-paid. Defective parts will be repaired or replaced with new or factory rebuilt parts at TYMETAL's sole option.

This limited warranty does not cover non-defect damage, damage caused by unreasonable use, damage caused by improper installation or care, vandalism or lightning, fire or excessive heat, flood or other acts of God (including, but not limited to misuse, abuse or alterations, failure to provide reasonable and necessary maintenance), labor charges for dismantling or reinstalling a repaired or replaced unit, or replacement batteries.

These warranties are in lieu of all other warranties, either expressed or implied. All implied warranties of merchantability and/or fitness for a particular purpose are hereby disclaimed and excluded. Under no circumstances shall TYMETAL be liable for consequential, incidental or special damages arising in connection with the use or inability to use this product. In no event shall TYMETAL's liability for breach of warranty, breach of contract, negligence or strict liability exceed the cost of the product covered hereby. No person is authorized to assume for TYMETAL any other liability in connection with the sale of this product.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state. Warranty effective after August 31, 2002.

**This Gate Operator is built in the USA and  
complies with all requirements of  
Underwriters' Laboratories Standard UL-325.  
P/N 111317    REV. O    November 2008**