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

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 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 Obstruction Detection Devices
The following contact or non-contact obstruction detection devices have been approved for use with this slide gate operator as part of a UL325 compliant installation:

- **Contact Edges**
  Miller Edge Models MGO20, MGR20, MGS20, ME120

- **Photoeyes**
  MMTC Model IR-55 (165’ range)
  MMTC Model E3K (28’ range)

Safety Information and Warnings
THE FOLLOWING FORMATS ARE USED FOR SAFETY NOTES IN THESE INSTRUCTIONS.

![CAUTION](image)
This type of warning note is used to indicate the possibility of damage to the gate or gate operator.

![WARNING](image)
This type of warning note is used to indicate possible mechanical hazards that may cause serious injuries or death.

![WARNING](image)
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 Corp. 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 and horsepower 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 115 V and 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. TYM 1000 Only: Electrical outlets are supplied in all 115VAC models for convenience with occasional use or low power consumption devices only. If you choose to run dedicated equipment from these devices, it will decrease the distance for maximum length and the charts will no longer be accurate.
8. TYM 1000 is 115v 1ph 6.0 amp draw. TYM 2000 is 208/230v 1ph 4.7amp draw.
9. TYM 2000 operator is dual (208/230) voltage single phase. No transformer tap change or motor rewiring is required for either voltage.
10. EARTH GROUND REQUIRED see pg. 6

### DC Control and Accessory Wiring
1. Open, Close, Stop control functions are 5 VDC. Use 20 ga stranded up to 2000'. Use 18 ga stranded from 2000' to 5000'.
2. Control wiring must be run in a separate conduit from power wiring and conduits must be separated my minimum 12". Running them together may cause interference and faulty signals in some accessories.
3. 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 25 for details of this connection. Note: The shield wire should be connected in both the operators.

### MODEL TYM 1000/2000 POWER WIRING

<table>
<thead>
<tr>
<th>VOLTS &amp; HP</th>
<th>MAXIMUM DISTANCE (FEET)</th>
<th>WIRE GAUGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SINGLE</td>
<td>DUAL</td>
</tr>
<tr>
<td>115 VOLTS 1/2-HP</td>
<td>222</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>354</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>566</td>
<td>283</td>
</tr>
<tr>
<td></td>
<td>900</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>1430</td>
<td>715</td>
</tr>
<tr>
<td>208 VOLTS 1-HP</td>
<td>544</td>
<td>272</td>
</tr>
<tr>
<td></td>
<td>864</td>
<td>432</td>
</tr>
<tr>
<td></td>
<td>1374</td>
<td>686</td>
</tr>
<tr>
<td></td>
<td>2184</td>
<td>1092</td>
</tr>
<tr>
<td></td>
<td>3476</td>
<td>1738</td>
</tr>
<tr>
<td>230 VOLTS 1-HP</td>
<td>640</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>1016</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>1616</td>
<td>808</td>
</tr>
<tr>
<td></td>
<td>2570</td>
<td>1285</td>
</tr>
<tr>
<td></td>
<td>4090</td>
<td>2045</td>
</tr>
</tbody>
</table>

**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!
Mounting Pad Installation

The gate operator mounts bolted to a custom poured concrete mounting pad. The pad supports the operator and prevents it from moving during operation.

An optional post mount kit is also available (P/N 2120-483) which allows installation without a concrete mounting pad.

Gate Preparation

Before installing the pad, make sure the gate rolls or slides freely, and that all exposed rollers are properly covered. The gate must be covered with fabric with openings no larger than 2-1/4" in size, to a minimum height of 72" above ground level. On picket-style gates, if pickets are spaced less than 2-1/4" apart, mesh is optional.

Mounting Pad Specifications

Recommended pad size is 21" x 21" minimum. Pad depth should be set according to local codes and at least as deep as frost line. 5/8" J-bolts may be set into the concrete before it sets following the dimensions shown, or drilled after the concrete sets.

WARNING

The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swing gates shall not open into public areas.
Figure 2: Operator Positioning - Parallel Placement

**Parallel Placement**

**INCORRECT**

**CORRECT**

**INCORRECT**

**CHAIN SUPPORT BRACKET** - Locate at each intermediate (1"x2") upright

**C = OVERALL GATE LENGTH**

SEE SUBMITTAL DRAWINGS FOR CHAIN CONFIGURATION DETAILS

*Figure 2: Operator Positioning - Parallel Placement*
Gate Mounting Bracket and Chain Assembly

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 the same way.

Attach the chain to both chain mounting brackets as shown in Figure 4, route the chain through the operator as shown in Figure 5.

Install chain support brackets as shown in Figure 6A or 6B as applicable to gate style. Brackets should support the chain but must not hit the operator. See Figure 1.

Adjust the chain to have 1-2” of sag between the chain supports as shown in Figure 2.

---

**Figure 3: Mounting Gate Bracket to Gate**

**Figure 4: Chain to Bracket Assembly**

**Figure 5: Chain Path**

**Figure 6A: Standard**

**Figure 6B: Ornamental**
Operator Preparation

Vent Plug Installation
In order to keep gear oil from spilling out during shipping, gear reducers used in this gate operator have either a solid plug, or a sealed vent plug, installed at the factory.

For operators with a solid plug, replace the solid plug with the vent plug provided (see Figure 7).

With the vent plug installed, remove the vent plug’s breather pin to allow the gear box to vent (see Figure 7).

Operator Setup

Controller Access
The Controller is protected by a plastic dust cover. To remove the dust cover, loosen the cover’s wing-screw and lift the cover off.

AC Power Connection

**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**

All Tymetal Corp. gate operators are supplied with a power disconnect switch to turn on and off the power available to the operator (see Figure 8). Following wiring specifications on Page 2, incoming power should be brought into the operator and connected to the labeled pigtails from the disconnect box. A wiring connections print can also be found on the label inside the cover of the operator.

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.

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 pad is not sufficient for a good earth ground.

✓ 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.
Operator Setup (Continued)

Limit Nuts Rough Adjustment

The limit nuts are not preset at the factory and must be adjusted for the length of 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 (see Figure 10). REMOVE THE CARDBOARD FILLER BEFORE ADJUSTING THE LIMIT NUTS.

The Controller is factory set for right hand installations. The left limit nut is for OPEN and the right limit nut is for CLOSE. The limit nuts flip their definition in left hand installations. (see left-right hand programming on Page 12).

1. With the gate connected to the gate operator in a mid-travel position, the power disconnect switch turned OFF, disconnect the operator by using the manual disconnect lever. Once the operator has been disconnected, manually move the gate by hand to within a foot of its fully open position (the foot of distance is necessary to allow for coasting of the operator after the limit switch is tripped).

2. Once the gate is in this position, adjust the OPEN limit nut until it activates the limit switch for open. Press down the detent plate and rotate the nut along the threaded shaft (see Figure 10).

3. After setting the open limit, move the gate to one foot from fully closed and repeat the process for the CLOSE limit nut (see Figure 10).

 Limit Nuts Fine Adjustment

After finishing the rough limit nut adjustments, reposition the gate to approximately the center of travel.

1. Re-engage the operator using the disconnect handle.
2. Turn the power disconnect switch ON.
3. Stand clear of any moving parts and press the OPEN button.
4. After the gate opens, press the CLOSE button.
5. 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).
Controller Features

Figure 12. Controller Features
<table>
<thead>
<tr>
<th>INDICATOR DESCRIPTION</th>
<th>INDICATION WHEN LIT DURING NORMAL OPERATION</th>
<th>INDICATION WHEN LIT DURING PROGRAMMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VOLT INPUT POWER</td>
<td>LOW VOLTAGE AC POWER IS PRESENT</td>
<td></td>
</tr>
<tr>
<td>24 VOLT DC ACCY POWER</td>
<td>LOW VOLTAGE DC POWER IS PRESENT</td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>OPEN SIGNAL PRESENT FROM THE INTERNAL RECEIVER OR AN EXTERNAL DEVICE CONNECTED TO THE OPEN INPUT TERMINAL</td>
<td></td>
</tr>
<tr>
<td>CLOSE</td>
<td>CLOSE SIGNAL IS PRESENT FROM A DEVICE CONNECTED TO THE CLOSE INPUT TERMINAL</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>STOP INPUT TERMINAL IS OPEN AND NOT CONNECTED TO COMMON</td>
<td>CONTROLLER IS IN PROGRAMMING MODE</td>
</tr>
<tr>
<td>PROGRAM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REVERSE</td>
<td>SIGNAL FROM REVERSING DEVICE IS PRESENT</td>
<td>SET REVERSE DELAY TIME</td>
</tr>
<tr>
<td>LOCKOUT</td>
<td>CONTROLS AND OPERATOR ARE LOCKED OUT BECAUSE OF EXISTING TROUBLE CONDITION</td>
<td>SET RUN ALARM AND PRE-START ALARM</td>
</tr>
<tr>
<td>RADIO</td>
<td>BUILT-IN RECEIVER IS DETECTING A RADIO SIGNAL FROM A REMOTE CONTROL</td>
<td>TRANSMITTERS CAN BE ENTERED INTO MEMORY (UP TO 40 TRANSMITTERS)</td>
</tr>
<tr>
<td>OPEN CURRENT</td>
<td>MOTOR CURRENT HAS EXCEEDED THE OPEN CURRENT SETTING WHILE OPENING</td>
<td>SET MAXIMUM OPEN CURRENT</td>
</tr>
<tr>
<td>OPEN OBSTR</td>
<td>OPEN OBSTRUCTION TERMINAL CONNECTED TO COMMON BY BEAM OR REVERSING EDGE, OR SIGNAL FROM MGT OBSTACLE TRANSMITTER</td>
<td>SET MGT #2 FUNCTION</td>
</tr>
<tr>
<td>OPEN RELAY</td>
<td>OPEN RELAY IS ACTIVATED</td>
<td>SET LEFT-HAND RIGHT-HAND OPERATION</td>
</tr>
<tr>
<td>OPEN LIMIT</td>
<td>OPEN LIMIT SWITCH IS ACTIVATED</td>
<td></td>
</tr>
<tr>
<td>CLOSE CURRENT</td>
<td>MOTOR CURRENT HAS EXCEEDED THE CLOSE CURRENT SETTING WHILE CLOSING</td>
<td>SET MAXIMUM CLOSE CURRENT</td>
</tr>
<tr>
<td>CLOSE OBSTR</td>
<td>CLOSE OBSTRUCTION TERMINAL CONNECTED TO COMMON BY BEAM OR REVERSING EDGE, OR SIGNAL FROM MGT OBSTACLE TRANSMITTER</td>
<td>SET MGT #1 FUNCTION</td>
</tr>
<tr>
<td>CLOSE RELAY</td>
<td>CLOSE RELAY IS ACTIVATED</td>
<td>SET AUTO-CLOSE TIME</td>
</tr>
<tr>
<td>CLOSE LIMIT</td>
<td>CLOSE LIMIT SWITCH IS ACTIVATED</td>
<td>SET MOTOR TYPE</td>
</tr>
<tr>
<td>SINGLE</td>
<td>SINGLE TERMINAL CONNECTED TO COMMON BY AN EXTERNAL PUSH BUTTON OR RADIO</td>
<td>SET SINGLE BUTTON INPUT FUNCTION</td>
</tr>
<tr>
<td>MAX RUN</td>
<td>MAXIMUM RUN TIMER HAS BEEN EXCEEDED</td>
<td>SET MAXIMUM RUN TIME</td>
</tr>
<tr>
<td>COMM LINK</td>
<td>DUAL OPERATOR CONNECTION DETECTED, BLINKS IF CONNECTION HAS FAILED</td>
<td></td>
</tr>
<tr>
<td>MAINT ALERT</td>
<td>MAINTENANCE IS REQUIRED ON OPERATOR</td>
<td>SET MAINTENANCE ALERT CYCLE COUNT</td>
</tr>
</tbody>
</table>

**APEX FUNCTION DISPLAY INDICATIONS**

- "RL" LEFT OR RIGHT HAND OPERATION
- "PM" SINGLE OR DUAL GATE
- "P" AUTO CLOSE TIMER
- "PP" 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
- "CP" CONSTANT PRESSURE MODE
- "SP" SHADOW LOOP OPEN INHIBIT
- "LP" LOW POWER MODE
- "FP" POWER FAILURE MODE
- "ST" SOFT START/STOP DURATION
- "CT" RESET CYCLE COUNT
- "RD" REVERSE DELAY TIME
- "CP" CONSTANT PRESSURE MODE
- "SP" SHADOW LOOP OPEN INHIBIT
- "AT" ANTI-TAILGATE ENABLE
- "MO" MOTOR TYPE SELECTION
- "RA" RADIO ENABLE
- "TL" LEARN TRANSMITTERS
- "TD" DELETE TRANSMITTERS
- "ML" LEARN MGT TRANSMITTERS
- "MD" ERASE MGT TRANSMITTERS
- "CL" RESET TO FACTORY DEFAULTS
## Terminal Descriptions

<table>
<thead>
<tr>
<th>TERMINAL</th>
<th>GROUP</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC N</td>
<td>24 VOLT INPUT</td>
<td>FACTORY CONNECTED TO 24 VAC FROM TRANSFORMER OR 24 VDC FROM CONTINUOUS DUTY DC SUPPLY.</td>
</tr>
<tr>
<td>AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC -</td>
<td>ACCESSORY POWER</td>
<td>PROVIDES 24 VOLT DC POWER FOR ACCESSORIES. (.5A MAX)</td>
</tr>
<tr>
<td>DC +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>RESET BUTTON</td>
<td>FACTORY CONNECTED TO THE CONTROLLER’S RESET BUTTON.</td>
</tr>
<tr>
<td>COMMON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>COMM LINK</td>
<td>FOR 3-WIRE NETWORK CONNECTION TO SECOND OPERATOR IN DUAL GATE INSTALLATIONS.</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMON</td>
<td>SINGLE BUTTON INPUT</td>
<td>CONNECT TO NORMALLY OPEN SWITCH FOR SINGLE BUTTON OPERATION. ALTERNATES BETWEEN OPEN-CLOSE OR OPEN-STOP-CLOSE DEPENDING ON PROGRAMMING.</td>
</tr>
<tr>
<td>SINGLE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIRE DEPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMON</td>
<td>FIRE BOX INPUT</td>
<td>CONNECT TO NORMALLY CLOSED SWITCH IN FIRE BOX FOR FIRE DEPARTMENT ACCESS.</td>
</tr>
<tr>
<td>FIRE DEPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>OPEN INPUT</td>
<td>CONNECT TO NORMALLY OPEN DEVICES (KEYPAD, CARD READER, KEY SWITCH, 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.</td>
</tr>
<tr>
<td>OPEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLOSE</td>
<td>3-BUTTON STATION INPUT</td>
<td>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.</td>
</tr>
<tr>
<td>COMMON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>OPEN OBSTRUCTION INPUT</td>
<td>CONNECT TO NORMALLY OPEN DEVICES (GATE EDGE, PHOTO BEAM) TO DETECT AN OBSTRUCTION DURING OPENING. WHILE GATE IS MOVING, ANY OPEN OBSTRUCTION SIGNAL WILL CAUSE THE GATE TO STOP, REVERSE A SHORT DISTANCE, AND THEN STOP AGAIN. AT THIS TIME THE AUTO CLOSE TIMER IS DISABLED, AND A RENEWED INPUT WILL BE REQUIRED TO START THE GATE AGAIN. SHOULD THE GATE BE RESTARTED AND THE OBSTACLE SIGNAL OCCUR AGAIN PRIOR TO REACHING A LIMIT, THE GATE WILL STOP AGAIN, LOCKOUT, AND SOUND THE CONTINUOUS TONE ALARM.</td>
</tr>
<tr>
<td>O-OBS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-OBS</td>
<td>CLOSE OBSTRUCTION INPUT</td>
<td>CONNECT TO NORMALLY OPEN DEVICES (GATE EDGE, PHOTO BEAM) TO DETECT AN OBSTRUCTION DURING CLOSING. WHILE GATE IS MOVING, ANY CLOSE OBSTRUCTION SIGNAL WILL CAUSE THE GATE TO STOP, THEN REVERSE AND TRAVEL TO THE FULL OPEN POSITION. SHOULD A OPEN OBSTRUCTION INPUT OR AN OPEN DIRECTION INHERENT ENTRAPMENT CONDITION OCCUR PRIOR TO THE GATE REACHING THE OPEN LIMIT, THE OPERATOR WILL LOCKOUT AND SOUND THE CONTINUOUS TONE ALARM. IF THE AUTO CLOSE TIMER IS SET, WHEN THE CLOSE OBSTRUCTION INPUT IS CLEARED, THE GATE WILL CLOSE WHEN THE AUTO CLOSE TIMER EXPIRES.</td>
</tr>
<tr>
<td>COM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>REVERSE</td>
<td>CONNECT TO NORMALLY OPEN DEVICES TO CAUSE A REVERSAL WHEN THE GATE IS TRAVELING CLOSED. THE GATE WILL REVERSE TO THE FULL OPEN POSITION.</td>
</tr>
<tr>
<td>REV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEN LOOP</td>
<td>OPEN LOOP</td>
<td>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.</td>
</tr>
<tr>
<td>REVERSE LOOP</td>
<td>REVERSE LOOP</td>
<td>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.</td>
</tr>
<tr>
<td>SHADOW/RESET LOOP</td>
<td>SHADOW/RESET LOOP</td>
<td>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.</td>
</tr>
<tr>
<td>-</td>
<td>ALARM</td>
<td>FACTORY CONNECTED TO THE ALARM BEEPER.</td>
</tr>
<tr>
<td>+</td>
<td>AUX RELAY</td>
<td>FOR CONNECTION TO AUXILIARY DEVICES (MAGNETIC LOCK, SOLENOID LOCK, STROBE LIGHT) FOR ACTIVATION (OR DEACTIVATION) DURING GATE OPERATION.</td>
</tr>
<tr>
<td>N.O.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>24 VOLT SOLAR PANEL</td>
<td>FOR CONNECTION TO 24 VOLT SOLAR PANEL FOR BATTERY CHARGING.</td>
</tr>
<tr>
<td>N.C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>24 VOLT BATTERY</td>
<td>FACTORY CONNECTED TO BATTERIES IN DC MODEL OPERATORS.</td>
</tr>
</tbody>
</table>
Operator Accessory Connections

Figure 13. Operator Accessory Connections

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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 25) 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 3-9 Seconds

Maximum Open & Close Current Variation Settings
To detect obstructions or mechanical problems with the gate, the operator monitors motor current and the amount that it varies during movement. If the current variation to open the gate exceeds the programmed range (variation), the operator will stop, reverse a short distance, and stop again. The Auto Close Timer will be disabled, and another open request will be required to start the operator. After a restart, if the overload or an open obstruction occurs before the open limit is reached, the operator will lockout and sound the alarm.

To view the running-current in the open direction, enter programming mode.
1. Scroll to OC [CC] function, while “OC” [“CC”] is being displayed.
2. Push ENTER (for 1 sec) to view the present setting.
3. Push and hold the OPEN [CLOSE] button for a minimum of 7 seconds of run for each direction. During movement, the motor current will be displayed as a current load # from 0 to 99. This number is useful for troubleshooting but not for setting the motor current variation.
4. Release the button at the end of travel (7 sec min) and a different number will flash. This number indicates the range (variation) above and below the average motor current during the run.
5. Re-set the range number slightly above the measured flashing range number using the + or - buttons. Push ENTER to store the value. A minimal force of 50-75 lbs should activate the reversal device should an obstruction occur. The setting should be high enough to keep the gate moving under other conditions resulting from temperature changes, component wear, debris, wind, snow, etc.
6. Verify your setting by measuring the force required to reverse the gate as per Gate Operator Installation Checklist in rear of manual.
7. Setting must be done for the CLOSE direction as well as the OPEN direction. Repeat steps 1 through 5 for the CC function.

Scroll to FUNCTION OC [CC]
Open [CLOSE] Current Variation Setting

1. ENTER
2. PRESS ENTER to view setting

Ex:

| 0. | 6. |

3. PRESS and HOLD the OPEN [CLOSE] button for 7 sec min. to cycle operator.

Ex:

| 2. | 3. |

Display will show the measured load number.

4. RELEASE the OPEN [CLOSE] button to view a FLASHING number.

Ex:

| 0. | 5. |

While display is flashing, PRESS +/- to set a value slightly higher than the FLASHING number.

5. ENTER
6. PRESS ENTER to store value.

NOTE: Values shown above are to provide an example. Actual values will depend on results determined at the actual installation. Installer MUST TEST & VERIFY proper operation of the inherent sensing for the site-specific installation.
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 an 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. See p. 27 for reset

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
(Rarely used in slide gate installations)
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 Delay Time programming function (see below) sets the length of the delay.
✓ NOTE: This function will only be displayed if dual gate operation is selected.
Advanced Controller Programming (Cont.)

Stagger Delay Time
(Rarely used in slide gate installations)
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 Time can be set from 1-99 seconds.
✓ NOTE: This function will only be displayed if dual gate operation is selected.

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

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.

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

- AC Motor Only
- DC Motor Only with Mechanical Braking
- DC Motor with Electronic Soft Start/Stop
- 3 Phase AC Motor
- AC Motor with DC Motor Backup with Mechanical Braking
- AC Motor with DC Motor Backup with Electronic Soft Start/Stop
Advanced Controller Programming (Cont.)

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

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

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

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

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

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>Function</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;LP&quot;</td>
<td>LOW POWER MODE</td>
</tr>
<tr>
<td>&quot;FS&quot;</td>
<td>FENCE STOP MODE</td>
</tr>
<tr>
<td>&quot;DC&quot;</td>
<td>DC IN MODE</td>
</tr>
<tr>
<td>&quot;CC&quot;</td>
<td>CURRENT</td>
</tr>
<tr>
<td>&quot;AP&quot;</td>
<td>ADVANCED PROGRAMMING</td>
</tr>
<tr>
<td>&quot;MT&quot;</td>
<td>MID-TRAVEL STOP POSITION</td>
</tr>
<tr>
<td>&quot;AT&quot;</td>
<td>ANTITALGATE ENABLE</td>
</tr>
<tr>
<td>&quot;TD&quot;</td>
<td>TAILGATE DISABLED</td>
</tr>
<tr>
<td>&quot;TQ&quot;</td>
<td>TAILGATE ENABLED</td>
</tr>
<tr>
<td>&quot;RE&quot;</td>
<td>REVERSE</td>
</tr>
<tr>
<td>&quot;RL&quot;</td>
<td>RIGHT OR LEFT</td>
</tr>
<tr>
<td>&quot;UP&quot;</td>
<td>UP</td>
</tr>
</tbody>
</table>

### DELETING TRANSMITTERS

- Press the "DELET" button to delete one transmitter.
- Press and hold the "DELET" button to delete all transmitters.

### LEARN NEW TRANSMITTERS

- Press the "LEARN" button to learn a new transmitter.

### LEARN TRANSMITTERS

- Press the "LEARN" button to learn a new transmitter.

### ERASE ALL TRANSMITTERS

- Press and hold the "LEARN" button to erase all transmitters.

### RESETTING THE PROGRAMMING SYSTEM

- Press the "RESET" button to reset the programming system.

### CURSOR MODES

- Press the "CURSOR" button to select a cursor mode.

### MOTOR TYPE SELECTION

- Press the "MOTOR TYPE" button to select a motor type.

### POWER FAILURE MODE

- Press the "POWER" button to enter power failure mode.

### FAILURE MODE

- Press the "FAILURE" button to enter failure mode.

### PRESS THE "LEARN" BUTTON TO LEARN A NEW TRANSMITTER

- Press and hold the "LEARN" button to learn a new transmitter.

### TO DELETE ALL TRANSMITTERS, PRESS AND HOLD THE "LEARN" BUTTON.

- To delete all transmitters, press and hold the "LEARN" button.

### THE DISPLAY WILL SHOW "---" WHEN THE TRANSMITTER IS ALREADY ENTERED.

- The display will show "---" when the transmitter is already entered.

### IF DEVICES AND "ERROR" WILL BE DISPLAYED

- If devices and "ERROR" will be displayed.

### "MA" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "MA" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "MD" WILL BE DISPLAED TO DELETE ALL TRANSMITTERS, CURRENT SENSE VALUES, AND THE CONTROLLER RETURN TO DEFAULT MODE.

- "MD" will be displayed to delete all transmitters, current sense values, and the controller return to default mode.

### "CM" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "CM" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C0" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C0" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C1" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C1" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C2" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C2" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C3" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C3" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C4" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C4" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C5" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C5" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C6" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C6" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C7" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C7" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C8" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C8" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "C9" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "C9" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "CP" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "CP" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "CR" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "CR" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "CS" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

- "CS" will be displayed for 30 seconds while the controller is ready to learn a transmitter.

### "CT" WILL BE DISPLAYED FOR 30 SECONDS WHILE THE CONTROLLER IS READY TO LEARN A TRANSMITTER.

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- "CT" will be displayed for 30 seconds while the controller is ready to learn a transmitter.
SEPARATE PEDESTRIAN GATE REQUIRED 7 FEET MINIMUM DISTANCE FROM GATE

USE RELIEF CUTS AT CORNERS

MUTIPLE TURNS

REFER TO LOOP INSTALLATION NOTES FOR DETAILS

LOOP SEALANT

3/8" LOOP

2" MAX.

2" MAX.

6 Feet

6 Feet

TWIST WIRE FROM END OF LOOPS BACK TO OPERATOR AT LEAST SIX TIMES PER FOOT

FREE EXIT OF REVERSING LOOP

REVERSING ENTRY LOOP

REVERSING EXIT LOOP
Model 2500-2346  
Operating Instructions  
Plug-in Vehicle Loop Detector  
Single Channel – Dual Solid State Outputs

General/Overview:
The Tymetal Corp. Model 2500-2346 operates on 12 VDC, 24 VDC, and 24 VAC. The detector is designed to handle gate, parking, drive-through, and all access control applications where solid-state outputs are required for both the “detect and “fail” outputs. From a diagnostic standpoint, the Model 2500-2346 automatically and continuously senses three (3) types of possible loop fault conditions: Open Loop(s), Shorted Loop(s), sudden changes in inductance exceeding 25% of the nominal inductance. The Model 2500-2346 also displays the frequency of the loop upon power up. Immediately after applying power, the unit displays 2 or 3 numbers quickly flashing (values between 13 and 150 kilohertz) before the DEFLECTOMETER resets to zero. This allows you to measure and separate the frequency of each detector loop. The detector frequency should be adjusted so that there is a minimum of 5 kilohertz of separation between all adjacent loops.

Setting Sensitivity:

The DEFLECTOMETER (front panel 7-segment LED) aids in setting the detector to the most optimum sensitivity level to help ensure the detection of all vehicles, including motorcycles and high bed vehicles.

For typical vehicles (mid-size vehicle / small pick up) utilizing properly installed roadway loops, when the number 4, 5, or 6 (5 being optimum) is displayed on the DEFLECTOMETER during the DETECT output period then the sensitivity is set correctly. For high profile vehicles (commercial trucks, 4x4’s, etc…), DEFLECTOMETER reading 3 or 4 will be best. For low profile vehicles (sports cars, etc…), DEFLECTOMETER reading 6 or 7 will be best.

Adjusting sensitivity utilizing the DEFLECTOMETER (Recommended):
The DEFLECTOMETER should read zero (0) with no vehicle over the roadway loop.

If a mid-size vehicle, located over the roadway loop causes the number “7” to be displayed on the DEFLECTOMETER, you need to lower the sensitivity two levels (7 – 2 = DEFLECTOMETER reading 5). This can be done by pressing the front panel SENS ▼ (down) push button twice.

If a mid-size vehicle, located over the roadway loop causes the number “2” to be displayed on the DEFLECTOMETER, you need to add three sensitivity levels (2 + 3 = DEFLECTOMETER reading “5”). This can be done by pressing the front panel SENS ▲ (up) push button 3 times.

Another great feature to note is that the sensitivity dynamically updates after each push button position change, allowing you to change sensitivity settings while a vehicle is over the loop zone.

Adjusting sensitivity without using the DEFLECTOMETER (Manually set Sensitivity):
The Model 2500-2346 offers 9 levels of sensitivity (1 to 9). This can be manually set to any desired level by pressing the SENS ▲ or SENS ▼ front panel push buttons when a vehicle is NOT over the roadway loop. The sensitivity level will be displayed on the 7-segment LED. The factory default is level 4. Pressing the SENS ▲ or SENS ▼ switch once will display the sensitivity without changing the setting. After pressing the SENS ▲ or SENS ▼ switches to display the sensitivity, the sensitivity can be changed by pressing the SENS ▲ or SENS ▼ switches again. The display will automatically return to the normal display after several seconds.

Dip Switch Functions:

Dip Switch 1 & 2 - Frequency:  The operating frequency is controlled by the setting of switches 1 & 2 of the 8 position DIP Switch. Occasionally when loops are in close proximity to each other, it may be necessary to select different frequencies for each loop detector to avoid loop interference (crosstalk). The actual loop frequency is a function of the size of the loop, number of turns of loop wire in the loop, length of the lead-in cable, and the setting of the frequency switches. When power is applied to the detector, the operating frequency (between 13 and 150 kilohertz) is displayed on the front panel 7-segment LED (2 or 3 numbers will quickly flash before the DEFLECTOMETER goes to zero) allowing you to measure the frequency of each detector/loop. The detector frequency should be adjusted so that there is a minimum of 5 kilohertz of separation between all adjacent loops.

Dip Switch 3 - Fail-Safe / Fail-Secure Operation: Either Fail-Safe or Fail-Secure Operation is controlled by the setting of switch 3 of the 8 position DIP Switch. The default position is Fail-Safe (switch 3 in the OFF position). If a loop fault occurs while in the Fail-Safe mode, Output A activates. If a loop fault occurs in the Fail-Secure mode (switch 3 in the ON position) Output A will not activate.

Dip Switch 4 & 5 - Output “B” Modes (pin 6): Output B has 4 selectable output modes: Loop Fault, B same as A, Pulse on Exit, Pulse on Entry. For Loop Fault Mode, if the loop fails the Output B will conduct indicating the failure. For either Pulse on Entry or Pulse on Exit a 250 millisecond pulse is generated on Output B. The default position is set to Loop Fault (switch 4 = OFF & switch 5 = OFF).
Dip Switch 6 - Delay Timing: The default position is set to OFF. When switch 6 is in the ON position, a 2-second “detect” delay feature will delay outputs A & B for a period of 2 seconds after a vehicle has entered the detection zone. Note that the DEFLECTOMETER will display the letter “d” for “Delay Time”. If the vehicle does not remain in the loop zone for the full 2 seconds the delay will terminate and no DETECT output will be produced.

Dip Switch 7 - Output “A” Modes: Output A has 2 selectable output modes: Infinite Presence and Normal Presence. The default position is Infinite Presence (switch 7 = OFF). In the Infinite Presence mode, a presence output will always be maintained as long as a vehicle is over the loop and power is not removed for more than approximately 3 seconds. In the Normal Presence mode (switch 7 = ON), the output hold time is between 5 minutes minimum and 3 hours maximum. Hold time depends on loop geometry; number of wire turns in the loop, vehicle size, and position of the vehicle relative to the loop.

Dip Switch 8 - Sensitivity Boost: The default position is set to OFF. When switch 8 is in the ON position and when a vehicle enters the loop zone, the detector sensitivity is boosted to a higher level than the vacant loop setting. The boosted sensitivity remains throughout the DETECT period. When the vehicle leaves the loop zone, the sensitivity returns to the vacant loop setting. This feature is designed to automatically increase sensitivity only during the DETECT output period. This feature aids in preventing dropouts during the passage of high bed vehicles and is particularly useful in sliding gate situations.

Detector Diagnostics: The detector continuously checks the integrity of the loop. The system is able to detect open or shorted circuit loops, or sudden changes in inductance exceeding 25% of the nominal inductance. If a fault is detected, the POWER and DETECT LED both continuously emit a sequence of flashes. Additionally, the 7-Segment DEFLECTOMETER displays F1, F2, or F3 indicating a current loop fault. Each type of fault is identified by a different flash sequence:

<table>
<thead>
<tr>
<th>Flash Sequence</th>
<th>Deflectometer Display</th>
<th>Fault Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 flash</td>
<td>F 1</td>
<td>Open Circuit Loop</td>
</tr>
<tr>
<td>2 flashes</td>
<td>F 2</td>
<td>Shorted Circuit Loop</td>
</tr>
<tr>
<td>3 flashes</td>
<td>F 3</td>
<td>25% excessive change in inductance</td>
</tr>
</tbody>
</table>

If the Open or Shorted fault condition self heals, the DETECT LED and 7-Segment DEFLECTOMETER will return to normal operation. Only the POWER LED will continue to flash with the sequence signifying the type of fault that was last detected. In the case of the excessive inductance change (F3) fault, the unit will return to the new inductance after a period of two seconds and continue operation. The previous fault condition will be indicated by the flash sequence of the only POWER LED. Pressing the “Reset” button will reset the detector and clear the flash sequence from the POWER LED. If you want to review the last loop fault condition, simply press and hold the “Reset” button for 2 seconds and the DETECT LED will display the previous loop fault condition.

Pin Assignments:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loop</td>
<td>6</td>
<td>Output B</td>
</tr>
<tr>
<td>2</td>
<td>Loop</td>
<td>7</td>
<td>Output B Inverted</td>
</tr>
<tr>
<td>3</td>
<td>Power (12-24VDC, 24Vac)</td>
<td>8</td>
<td>Output A (Presence Output)</td>
</tr>
<tr>
<td>4</td>
<td>No Connection</td>
<td>9</td>
<td>Power (12-24VDC, 24Vac)</td>
</tr>
<tr>
<td>5</td>
<td>No Connection</td>
<td>10</td>
<td>Common</td>
</tr>
</tbody>
</table>

Note: Power may be applied on either pin 3 or 9, or both
Using MGT Gate Reversing Edge Transmitters with the APeX Controller

Tymetal’s Model MGT Gate Reversing Edge Transmitter is compatible with the APeX Controller used in Tymetal’s swing and slide gate operators. The MGT transmitter is designed to connect to normally open gate edge contacts and is fully supervised.

During normal operation, when the edge contact detects an obstruction while the gate is moving, the MGT transmitter will send an obstacle signal to the APeX Controller and stop or reverse the gate.

Being supervised, the MGT transmitter sends hourly status reports. It also sends trouble signals to the APeX Controller when the transmitter detects a trouble condition. When a trouble signal is sent to the APeX Controller, the run alarm sounder will beep fast and continue beeping for five minutes, then the sounder will chirp every five seconds while the gate is idle. To clear the trouble annunciation at the gate, the transmitter’s trouble condition must be corrected first, then the Controller’s power must be cycled off and on.

Four conditions regarding the MGT transmitter can cause the APeX Controller to sound the audible trouble warning:

- **MGT transmitter case has been opened.**
- **Disconnected or shortened reversing edge when MGT transmitter edge supervision is enabled.**
- **Low batteries in the MGT transmitter.**
- **Hourly supervision signals from the MGT transmitter have not been received by the controller.**

**MGT Transmitter Troubleshooting**

When troubleshooting an MGT transmitter, first open the MGT and check the unit’s internal indicators. The POWER indicator should light when the reversing edge is pressed or the TEST button is pressed. If it flashes, the batteries are low. The LOOP TROUBLE indicator will light when the TEST button is pressed if the SENSOR TEST jumper is enabled and the reversing edge wiring is open or shorted.

**Tamper Supervision**

The MGT transmitter contains a spring loaded tamper switch that detects if the case is open. When the case is opened, the transmitter will immediately send a trouble transmission. Anytime the transmitter is serviced, you will need to open the case. After closing the MGT case, cycle the Controller’s power to clear the trouble annunciation.

**Edge Supervision**

MGT transmitters can monitor the connection to the gate edge if the gate edge is equipped with an internal 100µf capacitor. There is a jumper in the MGT that enables or disables the gate edge connection monitoring. If edge monitoring is enabled, and the connection to the gate edge is open or shorted, the MGT will send a trouble transmission with the next hourly status report to the controller. Use the transmitter’s jumper to disable edge supervision if the reversing edge does not contain a capacitor (the trouble loop indicator stays lit in the MGT transmitter). The jumper does not affect the transmitter’s hourly status reports.

**Low Battery Supervision**

MGT transmitters monitor their battery condition and will send a trouble transmission with the next hourly status report to the Controller when the battery tests low. Replace the batteries, close the MGT case, and power cycle the controller.

**Status Supervision**

MGT transmitters send hourly status reports to the Controller. The Controller expects those hourly status reports (this cannot be disabled in the APeX Controller). When the controller counts four missing transmitter status reports, the trouble annunciation will occur. This could occur from transmitter trouble or poor radio reception by the controller.

Open the MGT and test the transmitter by viewing it’s indicators and pressing on the reversing edge. If the transmitter tests OK, check the radio range of the Controller using a handheld transmitter. If a handheld transmitter cannot reliable activate the operator at the distance the MGT is from the controller, remotely mount the local antenna or use an external receiver antenna (Model EXA-1000 or EXA-2000). Also, Tymetal’s Model FT-1 Radio Interference Field Tester can be used to test the installation for abnormal radio interference conditions.
Reversing Edge Layout Illustration

NOTES:
1. WIRE THESE EDGES FOR CLOSE OBSTRUCTION
2. WIRE THESE EDGES FOR OPEN OBSTRUCTION
3. ON LEADING EDGE, WIRE FOR CLOSING OBSTRUCTION OR REVERSING IF DESIRED
4. ON TRAILING EDGE, WIRE FOR OPEN OBSTRUCTION
5. REFER TO ACCESSORY CONNECTIONS PAGES FOR DETAILS
6. IF SENSOR EDGES ARE HARD WIRED TO THE OPERATOR, CARE MUST BE TAKEN IN ROUTING THE WIRES SUCH THAT THEY DO NOT BECOME DAMAGED DURING NORMAL OPERATION (AVOID PINCHING AND ABRASION)

FOR CLARITY, FENCE AND PEDESTRIAN GATE NOT SHOWN

THIS DRAWING IS INTENDED TO DRAW ATTENTION TO POSSIBLE LOCATIONS FOR THE INSTALLATION OF CONTACT OR NON-CONTACT OBSTRUCTION SENSING DEVICES. OTHER AREAS OF ENTRAPMENT MAY EXIST DEPENDING ON EACH SPECIFIC INSTALLATION.
Photoeye Installation Illustration

- CARE MUST BE TAKEN IN THE PLACEMENT OF PHOTOEYES TO MINIMIZE NUISANCE TRIPPING.
- PHOTOEYE TO PROTECT FENCE LINE OUTSIDE OF PROTECTED AREA WIRED FOR OPEN OBSTRUCTION.
- PHOTOEYE TO GUARD POCKET AREA, WIRE FOR OPEN OBSTRUCTION.
- PHOTOEYE CAN BE MOUNTED ACROSS DRIVE WIRED FOR REVERSE ONLY ON EITHER SIDE OF THE GATE.
- NOTE: CONDUIT REQUIRED ACROSS ROADWAYS FOR PHOTOEYES.

SEE ACCESSORY CONNECTIONS FOR DETAILS.

SEPARATE PEDESTRIAN WALKGATE REQUIRED 7 FEET MINIMUM DISTANCE FROM GATE.
Picket Gate Installation

Possible locations for contact and non-contact devices shown above. Other areas of entrapment may exist depending on each specific installation.

Refer to installation manual for additional details for the installation and wiring of loops, edges, and photoeyes.
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.

- **Stagger Delay Time**
  The Stagger Time sets the length of the delay for the Stagger Mode.

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

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Figure 14. COMM LINK Wiring
Gate Operation

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

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

Stop Button
Stops the gate from opening or closing at any time.

Single Input
Opens the gate if it’s closed and closes the gate if it’s open (open-close programming option). Activating the input while the gate is moving will reverse the gate.
Can be programmed to stop the gate while the gate is moving (open-stop-close programming option).

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

Fire Department Access
Tymetal can provide an option for Fire Department Access via a lock box style remote release to accept a fire department padlock.
When the FD Access Box is mounted on the exterior of the fence line, this arrangement allows the fire dept to come up to a locked gate, unlock and remove their padlock, and open the gate for emergency access.
If there is power on the gate, the gate will open automatically via a micro-switch in the box door that is wired to the FIRE DEPT terminals in the APeX controller. The gate will stay open until reset by pressing the STOP button or the RESET button on the controller.
If the power is out, there is a handle inside the access box that can be pulled out to mechanically release the operator drive sprocket to allow the gate to be manually pushed open. The handle will be required to be pushed back inward to continue normal gate operation.
Note that a Knox brand padlock has a dust shield for the key, is plastic armored, and retains the key when unlocked. Knox supplies the keys to fire departments and assigns a specific key code for each fire district so that only one key is needed to open any Knox lock within a district.
For a drawing and pricing, please contact Tymetal Corp. in NY at (800)328-4283.

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 and reverse to full open. If auto close timer is set, gate will close when the obstruction is clear and the timer expires. Should an open obstruction input or open direction inherent entrapment condition exist prior to reaching open limit, the operator will lockout and sound the continuous tone alarm.

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
Only used with Swing Gates. Holds the gate fully open or fully closed while triggered. If open, the gate closes immediately when cleared.
Operation Indications

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

Power-up Display

When the Controller powers up, dashes will show on the display for one second, then the firmware version number will be displayed for one second.

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 $E$
- Full Close is displayed as $FC$
- Full Open is displayed as $FO$
- Entrapment is displayed as $En$

Pre-start Delay

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

Reverse Delay

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

Run Timer

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

Error Indications

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

Entrapment or Obstruction Reset

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

⚠️ WARNING ⚠️

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

COMM LINK Connection Failure

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

MGT Obstacle Transmitter Trouble

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

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

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

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

Maximum Run Time Exceeded

If the Maximum Run Time is exceeded, the Controller stops the operator the same as if a double obstacle has occurred in an entrapment condition. The entrapment alarm sounds constantly, and is cleared by pressing the STOP button or the RESET button on the cover. After the STOP or RESET button is pressed, because the Maximum Run Time has been exceeded, the sounder will beep twice every five seconds. The next operation of the gate will clear the indication.
Contributing Technical Support
For technical questions regarding Tymetal Corp. gate operators, contact the Technical Services Department at:
1-800-328-4283 from 7 AM to 5 PM EST.

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. Check for broken chain or worn belts.
B. 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
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.
The enclosed Safety Precaution literature which accompanies this information is required reading for all users of this system. It is also necessary to read the directives in this packet to familiarize yourself with the proper operation of this equipment. If the information appears incomplete, contact your installing dealer or the manufacturer for a complete packet or explanation before operating this equipment (Tymetal Corp. toll free number 1-800-328-4283).

- This automatic gate is for vehicular traffic only.
- **Children must never be allowed to play on, near or around a motorized gate.**
- Keep all control devices out of the reach of children.
- **Never operate this system without being in sight of the full path of travel of the moving gate!**
- Stand clear of the gate’s path of travel at all times. Gate may start without audible warnings. Consult your installing dealer regarding audible/visual pre-start options.
- Never reach between, through, or around the gate/fence to access the operator or any control device.
- Turn power off before operating the manual disconnect! A power on/off switch is inside the operator.
- There are no user-servicable parts inside.
- Do not attempt to make repairs or adjustments to the operator. Call your dealer or a qualified service technician to perform repairs.
- The gate must be maintained properly. If the operator shows signs of increased laboring while moving the gate, or if the gate appears damaged, have it repaired immediately. **TURN POWER OFF AND DISCONNECT THE OPERATOR FROM THE GATE UNTIL THE PROBLEM HAS BEEN CORRECTED.**
- The operator should be tested monthly by a qualified service technician.
IMPORTANT SAFETY INFORMATION AND WARNINGS

MANUAL DISCONNECT

In the event of power loss or mechanical failure, this slide gate operator is equipped with a manual disconnect level, located on the top of the frame of the operator. See the illustration at right. Make sure to turn the power off before disengaging the operator. **Never disengage the operator while it is running!**

To disengage the operator, pull the disconnect handle away from the front of the operator until the disconnect latch engages. The gate can then be pushed manually to open or close. To reengage the operator, pull the disconnect latch to the left until the disconnect handle snaps back into its original position. One the operator is re-engaged, you can reapply power. See the illustration at right for details.

**TURN OFF POWER BEFORE OPERATING THE MANUAL DISCONNECT!**

GATE OBSTRUCTION SENSING INFORMATION

This operator is equipped with UL 325 compliant controls. UL 325 requires that each installation have one primary, and at least one secondary obstruction-sensing device. Linear operators are also equipped with a primary current sensing device and contacts for connecting secondary obstruction sensing devices, contact sensor (edge sensor), or non-contact sensor (photo electric-type units).

Any number of access control devices can activate the gate operator. The primary obstruction sensing system and secondary obstruction sensing devices are designed to detect possible entrapment. The installer is required to place sufficient secondary devices to protect the possible pinch points. The installer determines proper location of secondary obstruction devices.

When the primary or secondary sensing devices send a signal before the gate reaches its full open or closed position the gate will STOP and BACK UP. Another open or close command will activate the gate again. IF a second obstruction signal is sensed before the gate reaches its full open or closed position then the gate will STOP, BACK UP, and sound a continuous ALARM.

**IMMEDIATE ATTENTION IS REQUIRED WHENEVER THE CONTINUOUS OBSTRUCTION ALARM IS SOUNDING!**

Check the gate for any obstruction, clear the obstruction, and then push the EMERGENCY STOP/RESET button located on the front of the operator. By pushing the EMERGENCY STOP/RESET button, the gate is now back in operation and awaiting the next command.

Contact your installing dealer or a qualified service technician to perform all adjustments that may become necessary.
NOTE: MAY HAVE OPTIONAL TORQUE LIMITER
## TYM 1000/2000 MECHANICAL PARTS LIST

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<thead>
<tr>
<th>REF. #</th>
<th>PART #</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>2300-907</td>
<td>Operator Cover</td>
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<tr>
<td>1A</td>
<td>2510-354</td>
<td>Plunger Reset Assembly</td>
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<tr>
<td></td>
<td>2500-2240</td>
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<td></td>
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<td>1B</td>
<td>2200-790</td>
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<td></td>
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<td>Reducer Coupler, with Oilite Bushing</td>
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<td>2200-117</td>
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<tr>
<td>11</td>
<td>2100-2026</td>
<td>Disconnect Collar</td>
</tr>
<tr>
<td>12</td>
<td>2200-014</td>
<td>Shaft Collar, 1&quot; diameter, 3/8&quot; LT B</td>
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<td>13</td>
<td>2100-1963</td>
<td>Drive Shaft, 1&quot; diameter</td>
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<tr>
<td>13A</td>
<td>2100-529</td>
<td>1&quot; Woodruff Key</td>
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<td>14</td>
<td>2100-1986</td>
<td>Disconnect Handle Fulcrum Bracket</td>
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<tr>
<td>15</td>
<td>2100-549</td>
<td>Pin for Disconnect Handle</td>
</tr>
<tr>
<td>16</td>
<td>2400-169</td>
<td>Push-on Nut, 1/4&quot; (not shown)</td>
</tr>
<tr>
<td>17</td>
<td>2120-477</td>
<td>Disconnect Handle</td>
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<tr>
<td>18</td>
<td>2100-2058</td>
<td>Disconnect Lever</td>
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<tr>
<td>19</td>
<td>2200-939</td>
<td>Locking Handle Spring</td>
</tr>
<tr>
<td>20</td>
<td>2200-274</td>
<td>Pillow Block Bearing, 1&quot; diameter</td>
</tr>
<tr>
<td>21</td>
<td>2200-042</td>
<td>Sprocket, 48-B-15, 1&quot; bore</td>
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<td>2200-276</td>
<td>Sprocket, 48-B-20, 1/2&quot; bore (For drives 34 to 42 feet wide)</td>
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<tr>
<td>22</td>
<td>2200-855</td>
<td>#48 Roller Chain, 18 Links (Use with 2200-276 Sprocket)</td>
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<tr>
<td>22A</td>
<td>2200-010</td>
<td>#48 Master Link</td>
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<tr>
<td>24</td>
<td>2510-423</td>
<td>ApeX Module</td>
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<td>2100-2104</td>
<td>ApeX Mounting Plate</td>
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<td>2300-1025</td>
<td>Plastic Cover</td>
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<td>2510-423</td>
<td>Knob Kit</td>
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<tr>
<td>25</td>
<td>2600-396-SLC</td>
<td>Limit Box Assembly with Cover</td>
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<td>2100-057</td>
<td>Limit Shaft</td>
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<td>2200-029</td>
<td>Oilite Bushing</td>
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<td>2200-030</td>
<td>Limit Nut</td>
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<td>2200-193</td>
<td>1/2&quot; E-ring</td>
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<td>2300-946</td>
<td>Heyco Bushing with Wire Guards</td>
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<td>2500-2347</td>
<td>Limit Switch</td>
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<td>2300-704</td>
<td>Auxiliary Limit Switch (not included)</td>
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<td>2100-261</td>
<td>Detent Plate</td>
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<td>2200-028</td>
<td>Detent Spring</td>
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<td>26</td>
<td>2300-945</td>
<td>Limit Box Cover</td>
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## REF. # | PART #     | DESCRIPTION                              |
<table>
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<tr>
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<tbody>
<tr>
<td>27</td>
<td>2500-2307</td>
<td>1/2 HP, 115 VAC, 1 Phase</td>
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<tr>
<td>28</td>
<td>2500-2312</td>
<td>1 HP, 208/230 VAC, 1 Phase</td>
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<tr>
<td>29</td>
<td>2500-2336</td>
<td>Capacitor for 2500-2307 Motor</td>
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<tr>
<td>30</td>
<td>2500-1932</td>
<td>Capacitor for 2500-2312 Motor</td>
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<tr>
<td>31</td>
<td>2200-118</td>
<td>4&quot; Pulley, 5/8&quot; bore</td>
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<tr>
<td>32</td>
<td>2200-955</td>
<td>4&quot; Pulley, 3/4&quot; bore</td>
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<td>33</td>
<td>2200-933</td>
<td>V-belt, 4L 33&quot;</td>
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<td>34</td>
<td>2100-2435</td>
<td>Alarm</td>
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<td>35</td>
<td>2200-952</td>
<td>Sprocket, 41-B-24, 1&quot; bore</td>
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<tr>
<td>36</td>
<td>2100-823</td>
<td>Idler Assembly</td>
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<td>37</td>
<td>2300-697</td>
<td>Idler Wheel, UHMW</td>
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<tr>
<td>38</td>
<td>2500-527</td>
<td>3/4&quot; Shoulder Bolt</td>
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<td>39</td>
<td>2400-528</td>
<td>5/8&quot; Lock Washer</td>
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<td>2400-529</td>
<td>5/8&quot; - 11 Nut</td>
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<td>40</td>
<td>2100-209</td>
<td>ApeX Controller Mounting Bracket (not shown)</td>
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<tr>
<td>41</td>
<td>2510-422</td>
<td>115 VAC Power Box Assembly</td>
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<td>42</td>
<td>2510-430</td>
<td>230 VAC Power Box Assembly</td>
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<td>43</td>
<td>2500-2411</td>
<td>Power Switch</td>
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<td>44</td>
<td>2500-2413</td>
<td>Power Outlet (only available on 115 VAC Models)</td>
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<td>2500-212</td>
<td>115 VAC - 24 VAC Power Transformer</td>
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<td>2500-791</td>
<td>230 VAC - 24 VAC Power Transformer</td>
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<td>2100-2113</td>
<td>Back Plate</td>
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<td>2100-2112</td>
<td>Cover Plate</td>
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<td>2500-424</td>
<td>115 VAC Wiring Harness Assembly (not shown)</td>
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<td>2501-428</td>
<td>230 VAC Wiring Harness Assembly (not shown)</td>
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<tr>
<td>45</td>
<td>2500-2029</td>
<td>Box, Junction</td>
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<td>46</td>
<td>2500-2224</td>
<td>Cover, Junction Box</td>
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<td>47</td>
<td>2100-2069</td>
<td>Back Plate</td>
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<td>48</td>
<td>2100-2101</td>
<td>Base Plate</td>
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<tr>
<td>49</td>
<td>2400-501</td>
<td>1&quot; Rotor Clip</td>
</tr>
<tr>
<td>50</td>
<td>2100-2062</td>
<td>Spacer, Gear Reducer</td>
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</tbody>
</table>
Preventative Maintenance

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

General
Tymetal Corp. 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.

This operator is built for cold climate use and includes synthetic gearbox lube, thermostatically controlled gearbox heater, cogged gearbelt and “critter” protection plates.

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. Lubricate with general purpose spray chain and cable lube.

6-Month Preventative Maintenance
1. Inspect V-belts for wear and replace as necessary. Check for proper tension and adjust if required. Check all pulley setscrews for tightness and tighten if necessary.
2. Inspect chain and sprockets for wear and replace if necessary. Check for proper tension and alignment, and adjust if required.
3. Check limit switches and limit actuators (cams, limit nuts, etc.) for wear and replace as required.
4. Inspect the installation area. Are all the warning signs intact and visible? If they are missing or need replacing, contact Tymetal Corp. 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.
5. Inspect disconnect handle for proper function and lubricate if necessary. Use a lithium based grease on all moving parts.
6. Inspect all nuts and bolts for proper tightness and tighten as necessary.
7. Check all reversing devices for proper function. Inspect all contact edges for wear and replace if required. Check photoeyes for proper alignment and function.
8. Check current sensing for proper adjustment when finished with inspection and maintenance.

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.

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.
<table>
<thead>
<tr>
<th>INSTALLER</th>
<th>CUSTOMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>___ ___</td>
<td>1. The gate has been checked to make sure it is level and moves freely in both directions.</td>
</tr>
<tr>
<td>___ ___</td>
<td>2. Potential pinch areas have been guarded so as to be inaccessible OR have contact and/or non-contact obstruction sensing devices installed.</td>
</tr>
<tr>
<td>___ ___</td>
<td>3. The installer has installed one or more contact or non-contact obstruction sensing devices, in compliance with UL325 requirements for this installation.</td>
</tr>
<tr>
<td>___ ___</td>
<td>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 all pedestrian traffic must use the pedestrian gate.</td>
</tr>
<tr>
<td>___ ___</td>
<td>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.</td>
</tr>
<tr>
<td>___ ___</td>
<td>6. There are no controls installed on the gate operator, or within seven feet of the gate.</td>
</tr>
<tr>
<td>___ ___</td>
<td>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)</td>
</tr>
<tr>
<td>___ ___</td>
<td>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.</td>
</tr>
<tr>
<td>___ ___</td>
<td>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.</td>
</tr>
<tr>
<td>___ ___</td>
<td>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.</td>
</tr>
<tr>
<td>___ ___</td>
<td>11. The installer has answered any questions the customer has regarding the operation of the gate operator and gate operator safety precautions.</td>
</tr>
<tr>
<td>___ ___</td>
<td>12. The installer has explained to the customer that a regular maintenance schedule for both the gate and the gate operator is recommended.</td>
</tr>
</tbody>
</table>

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