



# HYDRAULIC SLIDE GATE Operators With Smart Touch Controller

## Installation and Reference Manual

### Models

**TYM-HYD VF2** (X2) Heavier, fast gates  
**TYM-HYD VF3** (X3) Heavier, fastest gates

Modular and Correctional Facility versions available

This heavy duty industrial, high security, high performance gate operator is designed and manufactured by HySecurity to the specifications of Tymetal Corp.. Tymetal TYM-HYD operator meets or exceeds all HySecurity SlideDriver specifications and is backed by a 5 year Tymetal and HySecurity Gate, Inc. warranty. See back of manual for warranty details.

 **Tymetal Corp.**  
800-328-GATE (4283)







## TYM-HYD Quick Start

These instructions are provided as a quick reference guide to the experienced installer that is already familiar with all safety precautions and the installation of this gate operator.

**Do not attempt to install from this Quick Start guide if you are inexperienced with this product.**

1. Mount the operator with at least four mounting bolts. The operator must be square and spaced 2 ½" away from the face of the vertical gate members (see rail mounting kit).
2. Attach the drive rail to every vertical member of the gate at a height 9 ¼" above the base of the operator. Use ¼" roll pins to splice multiple sections of rail. (See page 16 & 17 for diagram).
  - Mount the two smaller, 11.5" limit switch stop ramps (each has 1 square end and 1 tapered end) to the underside of the drive rail at each end (flat side up, tapered end toward the wheel) in the drive rail slot closest to the operator. Drill 3/8" holes in a position that will allow the limit switches to be tripped 6-8" before full travel.
  - Mount the 2 long limit switch deceleration ramps in the outside channel of the drive rail, closest to the gate. Square ends should be even with the back (square) ends of the limit switch trip ramps.
  - On VF3 (X3) units, mount the 10.5" long auxiliary ramps (opposite tapers on each end) in the outside channel (closest to the gate) flush to the tapered ends of the long ramps.
3. Connect the electrical power wires to the loose wires from the On/Off switch at the left corner of the control box and attach the grounding wire to the loose green grounding wire also in the left corner of the control box. Verify that labeled voltage and phase of the operator matches the available supply.
4. Operators are shipped hydraulically configured for "right hand" operation. (From the secure side, the gate moves to right on opening). To change the handing, reconnect the hydraulic hoses at the pump in reverse order. There is a label near the hose connection point describing this procedure. Connecting the hose from the top motor to the left disconnect results in "left hand" operation.
5. With neither limit switch tripped, engage the release mechanism to clamp the wheels to the drive rail and verify that the red spring is compressed to 2" in height.
6. Turn on the power switch. The Smart Touch LCD display should show, after a 2 second delay, the characters [uC\_0]. This is a setting for the UL user class that must be made before any gate function will be possible. Press the Select button, then the Next button and change the 0 to be class 1-4 as appropriate for the site. Press the Select button again to lock the setting.
7. Press the Next button to go to the setting for the gate hand. The LCD display should now show [Sh\_0]. The 0 must be replaced by an [Sh L] or [Sh r] before any gate function will be possible.
8. Press the Menu button and the display will jump to the close timer setting [Ct\_0]. If a close timer function is needed, set in the same manner as above. Press the Menu button again to exit to the Run Mode. The LCD display should now read StoP but may read oPEn or CloS if any limit switch is tripped.
9. Test the normal operation of the gate. If the hoses are connected incorrectly, the gate will move the wrong direction. (See step 5.) If the gate moves the correct direction, but triggers an Err1 alert, the handing is set wrong. (See step 8.)
10. After normal function has been verified, connect any required accessory device wiring. Note that the control inputs (Except Fire Department Open and Emergency Close) are all one wire only to the main terminal strip while the other wire connects to the Common Buss on the nearby power supply board.
11. To access the User menu in the Smart Touch Controller, press the Menu button while there is no active Open or Close input. The display will scroll system values and stop at the [Ct\_] close timer setting. There are 11 menu items in the User Menu. To reach the more detailed Installer menu, the system must be in the User Menu first, then simultaneously press Open and Reset. The display will go to [uC\_] which is the first of 34 items in the Installer Menu. Read the instructions before attempting any adjustments!

## Smart Touch Controller Menu Guide for Sliding Gates

To gain access to the User Menu, press the Menu button when the gate is stopped. The LCD will scroll through several key items, then stop at the close timer setting [Ct ].

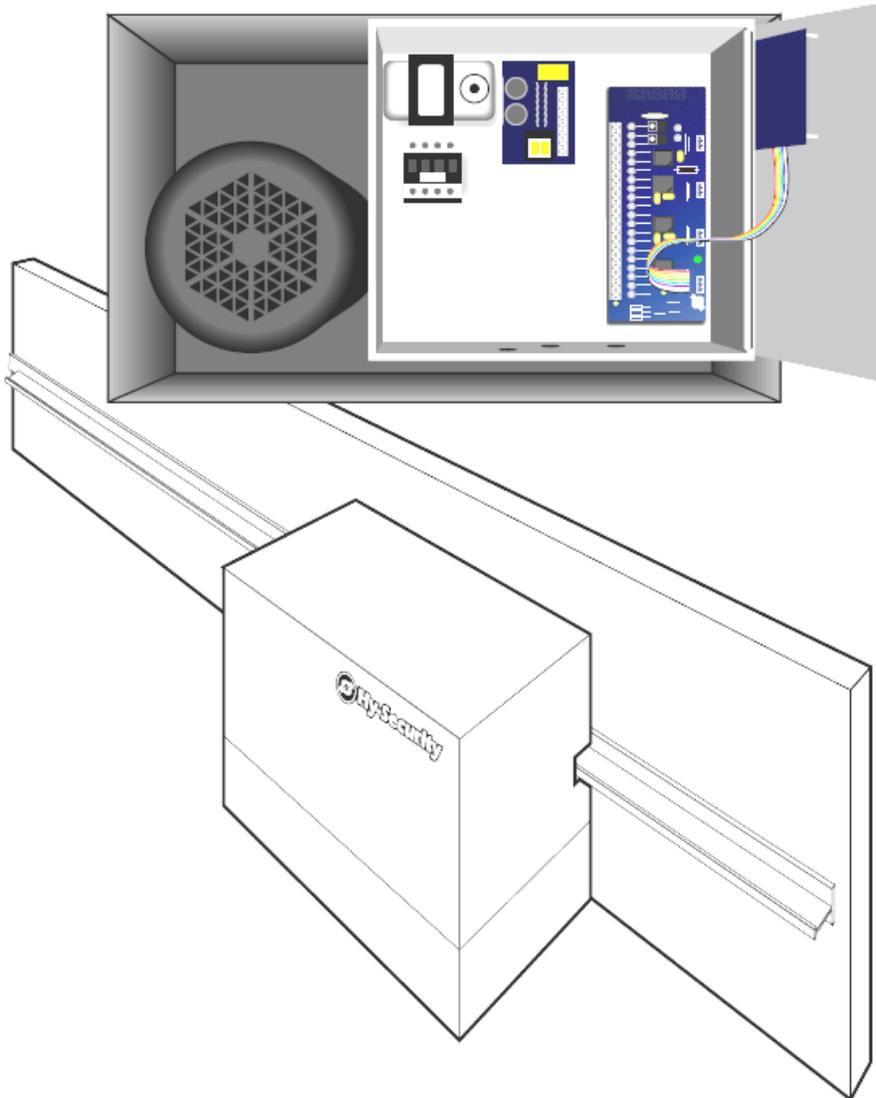
User Menu Options		Default	Description
U1	[Ct 0] Close timer setting	0	0 = close timer off or 1 – 99 seconds
U2	[hC 0] Momentary Close	0	0 = momentary, 1= Constant hold PB required to close gate
U3	[ho 0] Momentary Open	0	0 = momentary, 1= Constant hold PB required to open gate
U4	[AP 0] Power loss function	0	0 – 3 (0 =Type A, 1 = B, 2 = C, 3 = D) See handbook
U5	[ro 0] Radio control option	0	0 = Open only, 1 = Adds Close capability when fully open
U6	[bF 2] Warn before operate	2	0 = none, 1 = Buzzer alerts 3 sec before & when in motion, 2 = Buzzer alerts 3 sec before + first 2 seconds in motion
U7	[FA 0] Forced open Alert and automatic gate reposition	0	0 = disabled, 1 = sound buzzer (2 pulses/sec) if forced open for more than four seconds, time out in 30 Sec
U8	[dA 0] Drift Closed Alert and automatic gate reposition	0	0 = disabled, 1 = sound buzzer (2 pulses/sec) if drift closed and cannot reopen within four seconds.
U9	[PE 0] Photo Eye Align Mode	0	0 = off, 1 = on (auto off when close limit triggered)
U10	[CL 0] Clock set (24 hour type)	0	0= display, 1= set mins, 2= set hours, 3= set day, 4= month
U11	[Ld 5] LCD Contrast set	5	1 - 9 = Adjusts contrast of the display
U12	[dS 0] Data Log (New Gen only)	0	0 = Std. 1 = Extended (resets automatically to 0 in 24 hr) (V4.xx software)

To access Installer Menu, press the Open & Reset buttons together while in the User Menu.

Installer Menu Options		Default	Description
[uC 0]	Set UL Usage Class	0	0 = gate disabled, Set Class 1 through 4 use
[Sh 0]	Set Handing of gate	0	0 = gate disabled, r = Right Hand, L = Left Hand
[Fd 0]	Load Factory Defaults	0	0 = User settings, 1 = Load defaults (resets entire menu)
[bu 0]	Choose Buzzer Type	0	0 = Buzzer not set, 1 = Freq 1, 2 = Freq 2
[dg 0]	Set Master/Slave type	0	0 = Solo operator, 1 = Slave unit, 2 = Master unit
[Ch 0]	Set AC Charger or Solar	0	0 = DC + AC charger 1 = DC + Solar charger
[Fo 0]	Enable Fire Dept. Open	0	0 = input disabled, 1 = enabled
[oC 0]	Enable Emergency close	0	0 = input disabled, 1 = enabled
[SE 3]	Inherent Sensor sensitivity	3	1 = Maximum sensitivity, 9 = Lowest sensitivity
[SS 0]	Inherent Sensor function	0	1 = stop only (note, functions in usage class 4 only)
[LC 0]	Leaf delay Close	0	0 = none (1-7) ½ second steps (Master/slave only)
[Lo 0]	Leaf delay Open	0	0 = none (1-7) ½ second steps (Master/slave only)
[rt 0]	Maximum run timer	0	0 = 60 Seconds max run, 1 = 300 Seconds max run
[Po 0]	Partial Open distance	0	0 = input disabled, or 7 – 99 seconds of travel
[EC 0]	PEC reverse to open	0	0 = Close eye stops only, 1 = 2 sec reverse to open
[EO 0]	PEO reverse to close	0	0 = Open eye stops only, 1 = 2 sec reverse to close
[gr 0]	Edge reverse to open	0	0 = Edge reverses fully open, 1 = Edge reverses for 2 sec
[Sr 1]	IES reverse to open	1	0 = IES reverses fully open, 1= IES reverses for 2 sec
[PC 0]	Set PEO/ PEC – NO/NC	0	0 = Normally Open PE output, 1 = N.C. (Supervised mode)
[gC 0]	Set Edge input – NO/NC	0	0 = Normally Open Edge output, 1 = Normally Closed
[tC 1]	Time clock/ Interlock input	1	0 = select Time Clock, 1 = select Open Interlock
[dt 0]	Disable Free Exit/Timer to Close	0	0 = disable Free Exit, 1 = disable Close Timer
[or 1]	OOLD detector function	1	0 = pause closing only, 1 = enable reversing to open
[ir 1]	IOLD detector function	1	0 = pause closing only, 1 = enable reversing to open
[dL 1]	Vehicle detector logic	1	1 = std, 2 & 3 = quick close, 4 = full anti-tailgate logic
[r1 0]	User relay 1 option	1	0 = disabled, 1 – 24 = see output options page
[r2 0]	User relay 2 option	6	0 = disabled, 1 – 24 = see output options page
[r3 0]	User relay 3 option	1	0 = disabled, 1 – 24 = see output options page
[tL 0]	Gate Open alert	2	0 = 0 sec, 1 = 15s, 2 = 45s, 3 = 75s, 4 = 105s, 5 = 135s
[Lt 0]	Loitering alert	3	0 = 0 sec, 1 = 15s, 2 = 45s, 3 = 75s, 4 = 105s, 5 = 135s
[ELd0]	Test factory ELD	0	0=Run, 1=show freq, 2=show call level 0-7, 3= set Freq 1-4
[iLd0]	Test factory IOLD	0	0=Run, 1=show freq, 2=show call level 0-7, 3= set Freq 1-4
[oLd0]	Test factory OOLD	0	0=Run, 1=show freq, 2=show call level 0-7, 3= set Freq 1-4
[SLd0]	Test factory SLD	0	0=Run, 1=show freq, 2=show call level 0-7, 3= set Freq 1-4



# **Tymetal by HySecurity Ultra Reliable, Heavy Duty, Commercial, Industrial, High Security Slide Gate Operators**



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## Introduction

Welcome – Thank you for purchasing a Tymetal premium gate operator – manufactured by HySecurity, who has manufactured the finest hydraulic gate operators available since the 1970s. The commitment to quality and innovation will become evident as you become familiar with the features and performance of this expertly engineered machine. All HySecurity operators are equipped with the Smart Touch Controller, a digital electronic brain that offers unparalleled user benefits.

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



**Installers and owners must thoroughly review and understand the important Information regarding pedestrian entrapment protection contained in this manual. There are hazards associated with automatic gates that can be greatly reduced with proper design, installation and use. When an automatic gate is first commissioned, the installer must teach their owners and users how to correctly operate this system. When the installation is complete, installers should leave this manual for the owner's use and reference.**

Do not hesitate to give Tymetal Corp. a call if you experience any installation difficulties. Tymetal Corp. service technicians are experienced and trained to assist in resolving any problems.

**OPERATOR BULLETIN / WARRANTY REGISTRATION**

Fill out this form to register this operator(s) and to start product upgrade and technical emails. HySecurity and Tymetal distribute frequent maintenance, upgrade and tech bulletins to those who register their operators. Fax or mail this completed form to Tymetal (Fax 518-692-9404).

Date: \_\_\_\_\_

Owner Name / Company: \_\_\_\_\_

Email: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Tymetal Distributor: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Installer Name: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Serial number of operator: \_\_\_\_\_

Date Installed: \_\_\_\_\_

Operator Model: \_\_\_\_\_

**Warranty Registration**

Tymetal Address:

2549 State Route 40

Greenwich, NY 12834

FAX: (518) 692-9404

gatekeeper@tymetal.com

**Technical Support:** Call your installer or Tymetal service technician for front line technical support. Call Tymetal at 800-328-4283 with the serial number of your operator and we will provide you with the name of your installing contractor and support as necessary.

**Training:** HySecurity provides regular installation, maintenance and troubleshooting training on the operators built for Tymetal Corp.. Go to [www.hysecurity.com/support](http://www.hysecurity.com/support) or call HySecurity at 800-321-9947 for more information regarding HySecurity tech training.



## TYM-HYD Models

**HySecurity** manufactures many hydraulic slide gate operator models to suit the desired gate panel size, weight and speed. This manual should be used for TYM-HYD VF operators only. Identify your operator model and note the changes in instructions and final adjustments.

	TYM-HYD VF2 (222 X2)	TYM-HYD VF3 (222 X3)
<b>General</b>	Commercial industrial, high security	Commercial industrial, high security
<b>Gates</b>	Variable frequency drive (easy start and stop) heavy gates (5,000 lbs.) and fast (26 inches/sec.)	Variable frequency drive (easy start and stop) heavy gates (5,000 lbs.) and fast (36 inches/sec.)
<b>Duty</b>	Continuous	Continuous
<b>Modular</b>	VF2M	VF3M
<b>Prison</b>	VF2C	VF3C
<b>HP</b>	2 hp	2 hp
<b>Speed</b>	26 inches/sec.	36 inches/sec.
<b>Soft Stop</b>	yes	yes
<b>Brake Valves</b>	yes	yes
<b>Soft Start</b>	ultra soft start and stop	ultra soft start and stop
<b>Drawbar Pull</b>	300 lbs.	300 lbs.
<b>Weight Capacity</b>	5,000 lbs.	5,000 lbs.
<b>Drive Wheels</b>	2, 8" drive wheels	2, 8" drive wheels
<b>UL Class</b>	III, IV	III, IV
<b>Warranty</b>	5 years	5 years

## TYM-HYD Model Descriptions

### **High Speed, Very Heavy: TYM-HYD VF2 and VF3** (VF2 and VF3, UL class III and IV only)

These operators are designed for very heavy, up to 5,000 lb. gates moving at high and very high speeds. The variable frequency drive moves very heavy gates at speeds to up to 36 inches per second VF3, (VF2 = 26 inches per second). TYM-HYD VF models close gates to a very precise point and are extremely easy on gate hardware. TYM-HYD VF operators use a variable frequency drive, larger wheels and a higher flow rate pump to reach 2 to 3 inches per second.

### **The Smart Touch Controller**

This is the brain of the TYM-HYD operators. Groundbreaking technology built very ruggedly to reliably serve in the harshest environments. The Smart Touch Controller can quickly be configured by an installer or user to adapt to nearly any site specific functional requirement. All system settings are performed with the use of four programming buttons and an LCD display. The Smart Touch Controller has no switches to set. An RS232 port for external communication is standard. An EEPROM records date stamped system events. A log of events can be downloaded from the RS232 port to a laptop computer to evaluate abnormal gate system operation. HySecurity HY-5A vehicle detectors set a new industry standard by communicating valuable performance data to the Smart Touch controller, allowing quick and deep, user-friendly diagnostics.

**READ FIRST!****Important Information – Review before Installation**

Automatic gate operators provide user convenience and security. However, because these machines can produce high levels of force, it is important that all gate automated system designers, installers and end users be aware of the potential hazards associated with improperly designed, installed or maintained systems. Keep in mind that the gate operator is only one component of the automated gate system. It is the joint responsibility of the specifier, designer, purchaser, installer and end user to verify that the system is appropriately configured for its intended use. All parties should be informed that entrapment in a moving gate could cause serious injury or death.

**Common Industry Symbols**

**Attention  
-Take Note-**



**-Danger-  
Keep Away**



**Entrapment  
Zone**



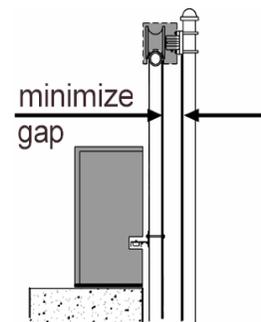
**Possible  
Pinch Point**

**Important Instructions for Gate System Designers & Installers:**

**WARNING:** To reduce the risk of serious injury or death, read and follow all instructions in the gate operator handbook and on the warning labels.

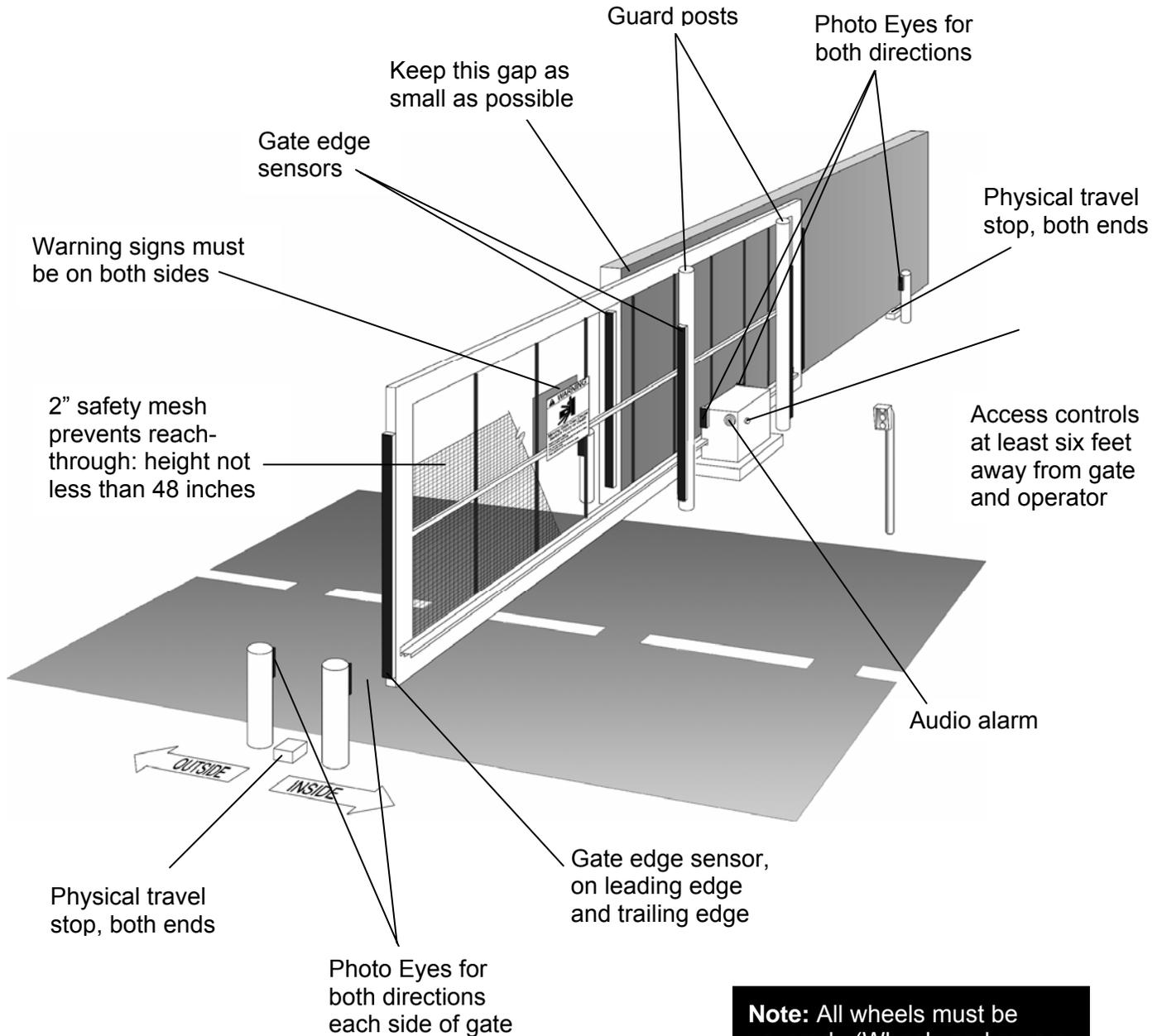
**Install an Automatic Gate Operator only When:**

- ❑ The entry is configured for vehicular use only. Pedestrians must be directed to a separate walk-through entrance. The Warning signs that have been supplied with this operator must be installed in a manner clearly visible on both sides of the gate.
- ❑ All openings of a horizontal slide gate are guarded or screened, from the bottom of the gate to a minimum of 4 feet (1.2 m) height above the ground, to prevent a sphere 2 ¼ inches (57 mm) in diameter from passing through an opening anywhere in the gate or the portion of the adjacent fence that is covered in the open position.
- ❑ All exposed pinch points, rollers and wheels are guarded. To reduce the risk of entrapment, the gate must also be installed so that enough clearance is provided between the gate and adjacent structures both when opening and closing. Minimize the parallel gap between the gate and the fence.
- ❑ The gate has been constructed with physical stops to prevent over-travel in both directions and has guard posts that prevent the gate from falling in the event of a roller failure.
- ❑ Review and meet all ASTM F-2200 and UL 325 automated gate system standards.





# Sliding Gate Entrapment Protection



**Note:** All wheels must be covered. (Wheels and covers not shown for clarity)

This schematic view is not meant to recommend a specific configuration. It is meant to point out the important elements of a proper automatic vehicular gate installation. The gate operator is only one component in the total system. **Always install a separate pedestrian gate.**

## Site, Gate, Equipment and Regulatory Requirements

- ❑ The gate moves freely in both directions. Never over-tighten a clutch or pressure relief valve to compensate for a stiff gate.
- ❑ The operator will be installed on the secured (non-public) side of the gate.
- ❑ The operator will be properly electrically grounded and the intended supply voltage matches the voltage label on the operator.
- ❑ The gate operation controls have been mounted far enough away from the moving gate such that users cannot touch the gate while operating the controls. All easily accessible controls must have a security feature to prevent unauthorized use.
- ❑ The operator controls will be located in line-of-sight to the gate. Radio controls and other remote access controls must be connected only to the **Remote Open input**.
- ❑ Required external entrapment sensors will be installed. Be certain to carefully review the instructions for placement, installation and adjustment of these external entrapment sensors. External entrapment sensors must function to reverse the movement of the gate **in both opening and closing directions**. If edge (contact) sensors are used, they are to be mounted on the leading and trailing edges of the gate, as well as post mounted on the inside and outside of the gate (See figure on page 4). If photo eyes or other non-contact sensors are used, they are to be mounted in locations most likely to guard against entrapment. A combination of contact and non-contact sensors may be used, but all must be recognized components under the UL 325 standard. See pages 31 and 32 for details on the requirements.
- ❑ If entrapment protection is provided by a continuous pressure actuation control, a placard stating “WARNING” – “Moving Gate has the Potential of Inflicting Injury or Death - Do Not Start Gate Unless Path is Clear” must be posted. Additionally, no other activation device shall be connected and an automatic closing device of any kind shall not be used.
- ❑ The automatic operator is labeled as appropriate for both the type and UL usage class of the gate. **Note:** TYM-HYD VF2 and VF3 sliding gate operators must be installed only for Class III & IV applications.  
 Class I: Intended to serve single to four family residential uses  
 Class II: Multi-family use, or any application intended to serve the general public  
 Class III: Commercial applications **not** intended to serve the general public  
 Class IV: Highest security. Security personnel prevent unauthorized access
- ❑ Sliding gate operators installed in Class III & IV applications do not have a speed restriction and the secondary entrapment sensor requirement is met if the system is configured as described for Class I & II use, or by the following alternate means: Employ the use of a 100dB buzzer, which sounds at least 3 seconds before the gate moves, and/or functions **only** by use of a constant hold type push button control.

## Important Information for Gate System Owners & Users



**WARNING:** To reduce the risk of serious injury or death, read and follow all instructions in the gate operator handbook and on warning labels.

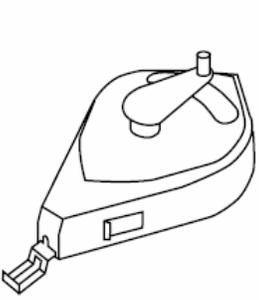
### Save These Important Owner and User Instructions:

(Installers – be certain to instruct the owners and users about the following items)

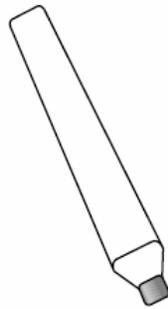
- ❑ Automatic gates are for vehicular use only! Provide walkways and signs to direct pedestrians to a separate walk-through entrance. Because an automatic gate can start at any time without warning, always keep people away from the gate area. The Warning signs that have been supplied with this operator must remain installed, in manner clearly visible on both sides of the gate.
- ❑ Never allow children to use or play with controls that operate the gate. Keep all remote controls away from children, especially radio transmitters.
- ❑ Teach all users how to turn off the electric power and how to release and move the gate manually. Use the manual release only when the gate is not moving.
- ❑ Test gate operator functionality monthly. The gate **MUST** reverse direction of travel upon contact with a rigid object, and/or stop upon sensing a 2<sup>nd</sup> sequential activation prior to reaching a full travel limit. Also test for the normal function of any non-contact sensors. If the gate system employs the use of a transmitting edge sensor, be especially certain to routinely test and replace its battery.
- ❑ **KEEP AUTOMATIC GATES PROPERLY MAINTAINED.** Have a professional gate installer perform routine entrapment protection sensor tests, including photo eyes and gate edges. Also, make all necessary gate hardware repairs to keep the gate running smoothly. Failure to adjust and test a gate operator properly can increase the risk of injury or death.
- ❑ In addition to appropriately placed external entrapment sensors, ask your installer to reduce the pressure relief valve setting to the lowest setting allowable that reliably operates the gate. This valve controls the force of the operator, and the sensitivity of the inherent reversing sensor.
- ❑ **Do not attempt to disable or muffle the Warn Before Operate buzzer, except in class IV restricted access locations. This buzzer provides an alert that the gate is about to move.**



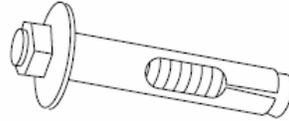
## Required Tools



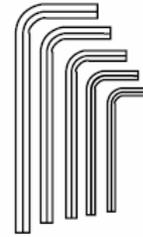
1. Chalkline or other builders string



2. Carpenters pencil or crayon



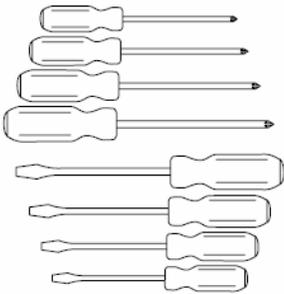
3. Concrete anchor bolts, four 1/2" x 4"



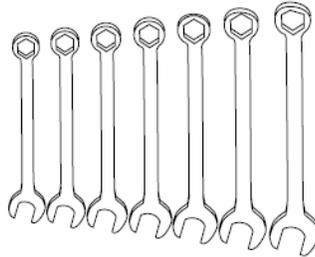
4. Allen wrench set



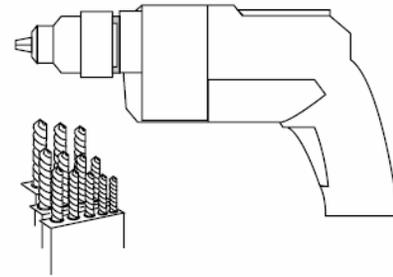
5. Hammer



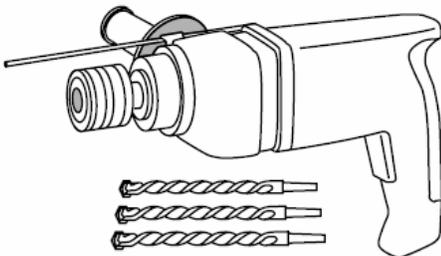
6. Screwdriver sets, Straight and Phillips



7. Wrench set, open end, 1/4" through 1"



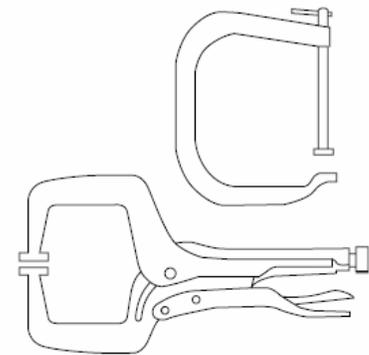
8. Electric drill and bits, 1/8" through 3/8"



9. Roto-hammer and bits



10. Level (installation must be level)

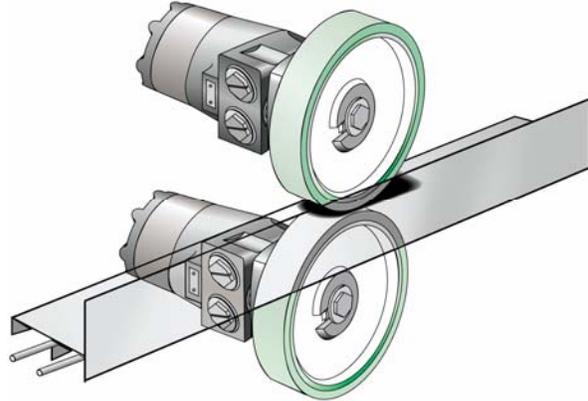


11. Two pair wide Jaw pliers or two C clamps, 4" cap.

# Getting Started

## How this hydraulic operator works

TYM-HYD industrial slide gate operators rotate polyurethane treaded drive wheels which grip a rigid metal drive rail and feed it right or left during the gate travel. The drive wheels are clamped above and below the drive rail and are directly coupled to powerful hydraulic motors, which easily moves large gates. This simple yet durable drive system is one of the unique features giving our hydraulic operators their reputation for reliability.



## Accessory Compatibility

TYM-HYD operators are fully compatible with all standard access control devices and entrapment protection devices, some of which are listed below.

## Pedestrian Entrapment Protection

Read and understand all the important information in section 1, the entrapment protection Schematic on page 4 and the UL requirements on page 3 before installing. Be absolutely certain that the required type and quantity of entrapment protection devices have been supplied and that you understand how to install them correctly. Contact your local distributor with questions about Entrapment Protection.



- Basic Access Control**
- Radio Transmitter
  - Long Distance Control
  - Pushbutton Control Station
  - Programmable Time Clock
  - Card Reader



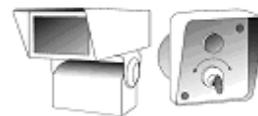
- Advanced Access Control**
- Access Control Interface
  - Card Reader
  - Keypad
  - Telephone Entry
  - Input/Output
  - Computer Interface
  - RS232/485



- Information**
- Signs
  - Labels
  - Warnings



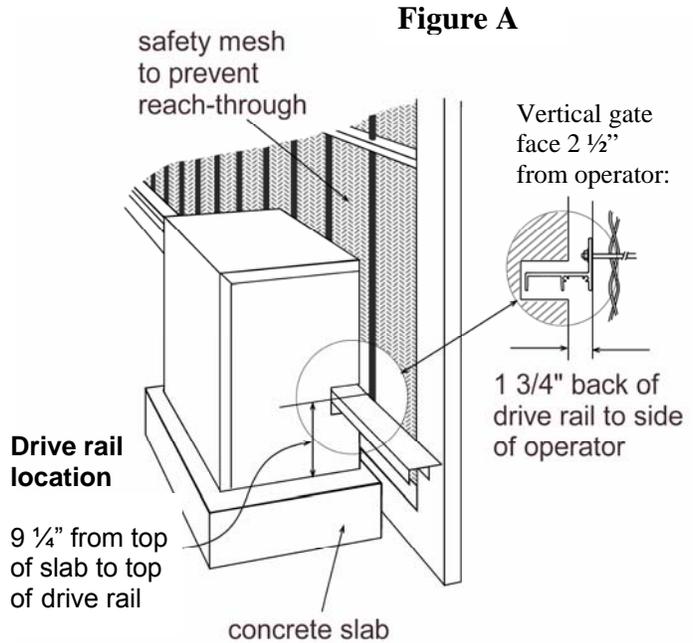
- Obstruction Sensing Devices**
- Inherent Sensing Device
  - Gate Edges
  - Photo Eyes
  - Vehicle Detectors (HY-5A)



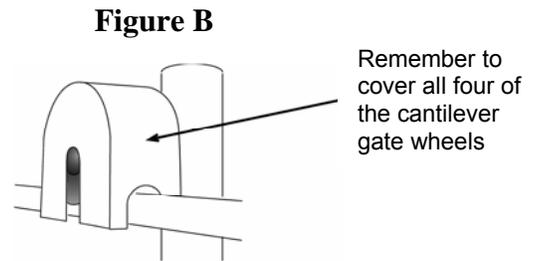
- Security**
- Key Locks
  - Closed Circuit Television
  - Gate Position Indicator
  - Interlock/Sally Port
  - Gate Status Indicator

# Installation Preparation Checklist

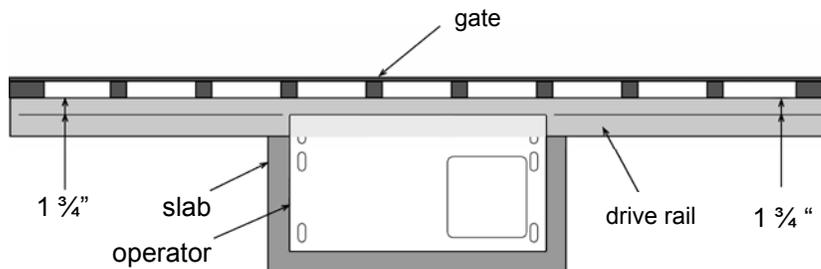
1. Read *all* instructions, especially the Important Information in Section 1 at the beginning of this manual, before you attempt installation. This section is focused on mechanical installation. For electrical setup, refer to Section 3 on system configuration and use of the Smart Touch Controller.
2. Check to see that the mounting slab is the recommended size and ready for operator attachment. Also check that electrical conduits are correctly located to enter the chassis. Tymetal recommends that a slab reaches below the local frost line and extends somewhat above grade. See the footprint plan and elevation view on pages 14 and 15.



3. Make sure the gate rolls smoothly in both directions, without any gate hardware binding. If the gate is warped or hard to move, stop and fix the gate before attempting to automate it.
4. Tymetal recommends using cantilever gate systems with extruded track and enclosed wheels. If an exposed wheel system is used, all of the exposed cantilever gate wheels **must** be covered. Also, look around to identify all potential pinch points and hazardous areas, and plan the best location for entrapment protection devices and warning signs. Remember that you are required to advise the owner regarding potential hazards and about the function of the entrapment protection sensors that you have selected and installed.



5. There are 3 steps to a perfect install: location, location, location. One of the most critical installation adjustments will be to make sure the operator is located the proper distance from the gate, and that the gate and operator are as parallel as possible. See Drive Rail Installation Instructions and Figure C below. Prepare shims to align drive rail.



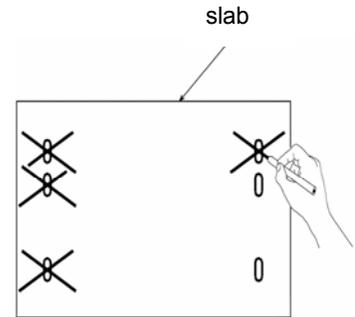
**Figure C**

Note: If necessary, shim the drive rail so that it is straight  $\pm 1/4$ " throughout the gated travel distance.

## Installation

### 1. Drill four holes for concrete anchors

A paper template can be made by setting the operator on a large sheet of paper and tracing the outside edges and anchor slots. Place the template or operator on the slab; making sure that it is parallel to and  $2\frac{1}{2}$ " from the face of the gate vertical member. Do NOT measure distance from the bottom horizontal gate frame member (dimensions vary). Trace the slots, remove the template, and then scribe the locations for anchor bolts. Drill holes for the anchor bolts in the center of the slots you marked so that you will have some room for adjustment. There are six mounting slots in the chassis, install at least four  $\frac{1}{2}$ " x 4" concrete anchor bolts, using two per side.



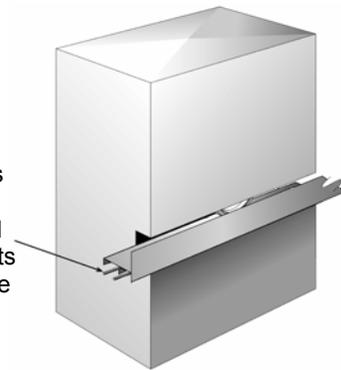
### 2. Line up the operator

Put the operator in position onto the anchor bolts. Verify that the operator is parallel (within  $\frac{1}{8}$ ") and  $2\frac{1}{2}$ " away from the face of the gate vertical member on both the left and right sides, and then tighten the anchors securely.

### 3. Bolt the Drive Rail to the Gate Panel

Connect multiple sections of drive rail together with  $\frac{1}{4}$ " roll pins for a perfect splice. The drive rail must be bolted to each vertical member of the gate panel per the instructions on the following pages. Instructions are also included with the drive rail hardware. If the gate is bent or warped, shim the drive rail so that it is straight  $\pm \frac{1}{4}$ " throughout the travel of the gate. When the drive rail has been installed at the correct height, the top surface is  $9\frac{1}{4}$ " above the operator base. A label and notch on each side of the operator indicates the correct height.

Roll pins line up drive rail segments to assure perfect splicing

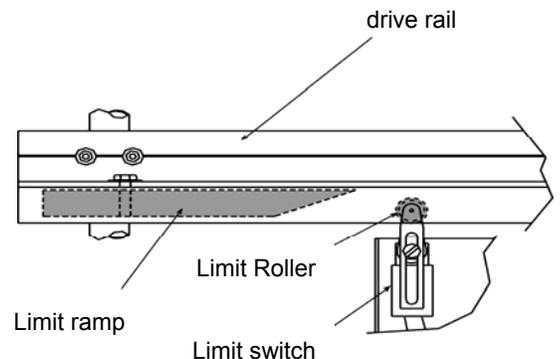


### 4. Install Limit Ramps on Underside of Drive Rail

TYM-HYD VF2 and VF3 operators have two sets of limit ramps. The ramps mounted farthest from the operator and closest to the gate are deceleration ramps (these are the longest ramps). The ramps mounted closest to the operator, farthest from the gate are stop ramps. Push the gate to the fully closed position and drill two  $\frac{3}{8}$ " holes through the drive rail to mount a 12" plastic limit ramp under the drive rail, in the wheel channel. Locate drive rail so that it will trip the limit switch approx. 2" before the exact spot you want the gate to stop. Adjust the ramp left or right to achieve exact stopping point. Fully secure by tightening both bolts. Adjust the lever arms on the limit switch so that the roller clears the underside of the drive rail by at least  $\frac{1}{4}$  inch. Push the gate fully open and repeat this procedure with the other limit ramp.

Install the deceleration ramps in the outside (farthest from the operator) channel of the drive rail, with the flat end parallel to the flat end of the stop ramp.

Note: The VF2 has 1 deceleration ramp, approx. 29 inches long. The VF3 has one additional ramp, approx. 11 inches long making the total deceleration ramp 40 inches long.

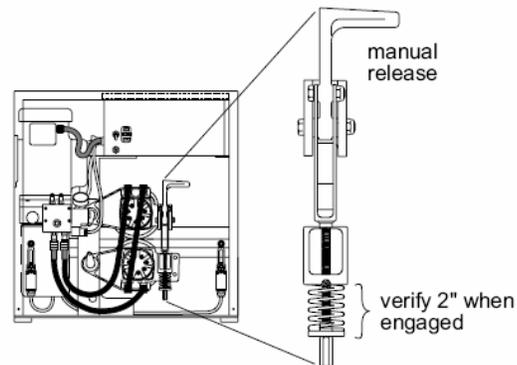


See page 16-17 for expanded limit ramp view.

## Installation

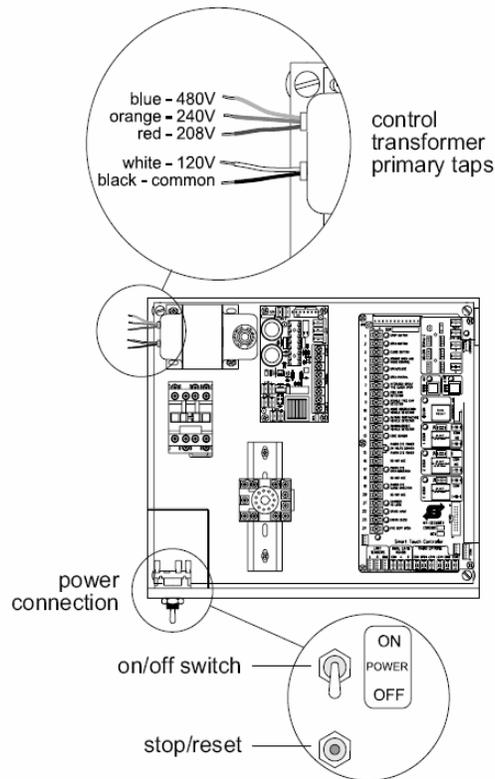
### 5. Clamp the Drive Wheels to the Drive Rail

When the wheels are fully clamped on the drive rail, the red spring should be compressed to 2" in height. If adjustment is necessary, turn the nut at the bottom of the threaded rod assembly. Slightly less compression is okay for lighter gates. See Use and Adjustment of the Manual Release Mechanism on page 57.



### 6. Electrical Power Connection

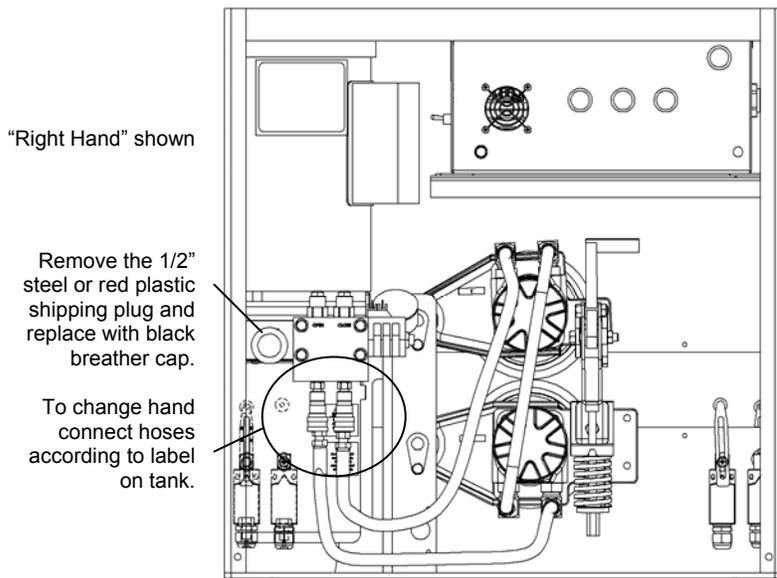
This operator is intended for permanent installation. All electrical conduits must be properly connected to the control box. The entry for the primary power is a 1/2 - 3/4" knockout on the left side of the control box next to the on-off switch. The operator was built to run on a specific voltage and phase. Make sure you have compared the available line voltage and phase with the voltage and phase listed on the nameplate on the machine. They must match! Be certain that the branch circuit wire size vs. the distance of the run from the main panel is large enough to avoid excess voltage drop. At a minimum, a 20 amp circuit (protected with a 20 Amp Inverse Time Breaker) should be provided. Also be sure the operator is electrically grounded per NEC Article 250 and local codes. See page 56 for correct wire sizes and detailed electrical wiring information.



### 7. Primary Tap of Control Transformer

Check to make sure that the primary tap on the control transformer matches the line voltage you have connected to the operator. Measure the line voltage carefully to distinguish between 208V and 230V branch circuits, or between 390V and 460V branch circuits. A label on top of the transformer identifies the various voltage taps.

## Installation



### 8. Check the operator "Hand"

All slide operators must have their "hand" set before they can function. The "handing" must be set both by the proper hydraulic hose connection and by programming the Smart Touch Controller. The proper handing hose connection is described on a label near the hose connection point. Also, see the instructions to set handing on page 19 "Installation Configuration for Smart Touch Controller." Operators are shipped configured for right hand operation. Operator handing is viewed by standing in the roadway on the operator side looking out. A gate which opens to the right uses a right hand operator. A gate which opens to the left uses a left handed operator. To change the handing of the operator, reconnect the hydraulic hoses at the pump in reverse order. There is a label near the hose connection point describing this procedure. Connecting the hose from the top motor to the left disconnect results in left hand operation.

### 9. Replace the Shipping Plug!

Replace the 1/2" steel or red plastic shipping plug on the front side of the pump with the black breather cap.

### 10. Setup Smart Touch Controller

The operator controls will not allow the gate to function until the Smart Touch Controller has been configured. Wait to connect external controls until you have reviewed Smart Touch Controller instructions and tested operator basic functions.

**Note:** Tymetal has an installation CD available free of charge to installers. Call Tymetal for your copy.

## Mechanical and Hydraulic Adjustments

### 1. Drive Wheel Spring Tension

When the drive wheels are fully clamped on the rail, the red spring should be compressed to 2" in height. Turn the nut at the bottom of the threaded rod assembly to adjust. Slightly less compression is okay for lighter gates. (See Figure on page 11)

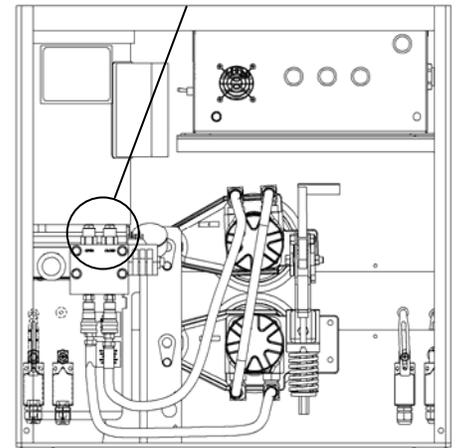
### 2. Drive Rail

Verify that the drive rail does not vary more than 1" up and down, or 1/4" in and out throughout the entire horizontal travel of the gate. Re-alignment is simple if the rail is mounted with U bolts. To adjust in and out, loosen the U bolts and add or remove shim stock. To adjust up or down, loosen the U bolts and simply tap the rail with a hammer until the correct height is reached. Adjusting the rail in or out requires inserting shims between the rail and the gate where necessary.

### 3. Brake Valves

If your operator is equipped with brake valves, their proper adjustment is important for smooth operation of the gate. In order for the brake valves to have time to function, the limit ramp must trigger the limit switch at least two inches before the point at when you want the gate to stop. Adjustment of the brake valves, one for each direction of travel, will determine how quickly the gate actually stops. If adjustment is needed, loosen the 9/16" lock nut on the top of the brake valve and turn the adjustment stem, in about 1/4 turn increments, with an Allen wrench. The adjustment works opposite of typical, such that a counter-clockwise adjustment will stop the gate more rapidly. If the adjustment is set too loose, the limit ramps will bang into the drive wheels. If the adjustment is set too tight, the system pressure will increase, the gate speed may decrease and the gate will jerk to a stop. Brake valves are factory-set to midpoint, two turns. This *should* be sufficient for most applications. If the switch stops more than two inches into the limit ramp, increase braking. When the adjustment is complete, retighten the locking nut to hold the setting.

Optional brake valves CCW = quicker stop  
Left valve controls open  
Right valve controls close



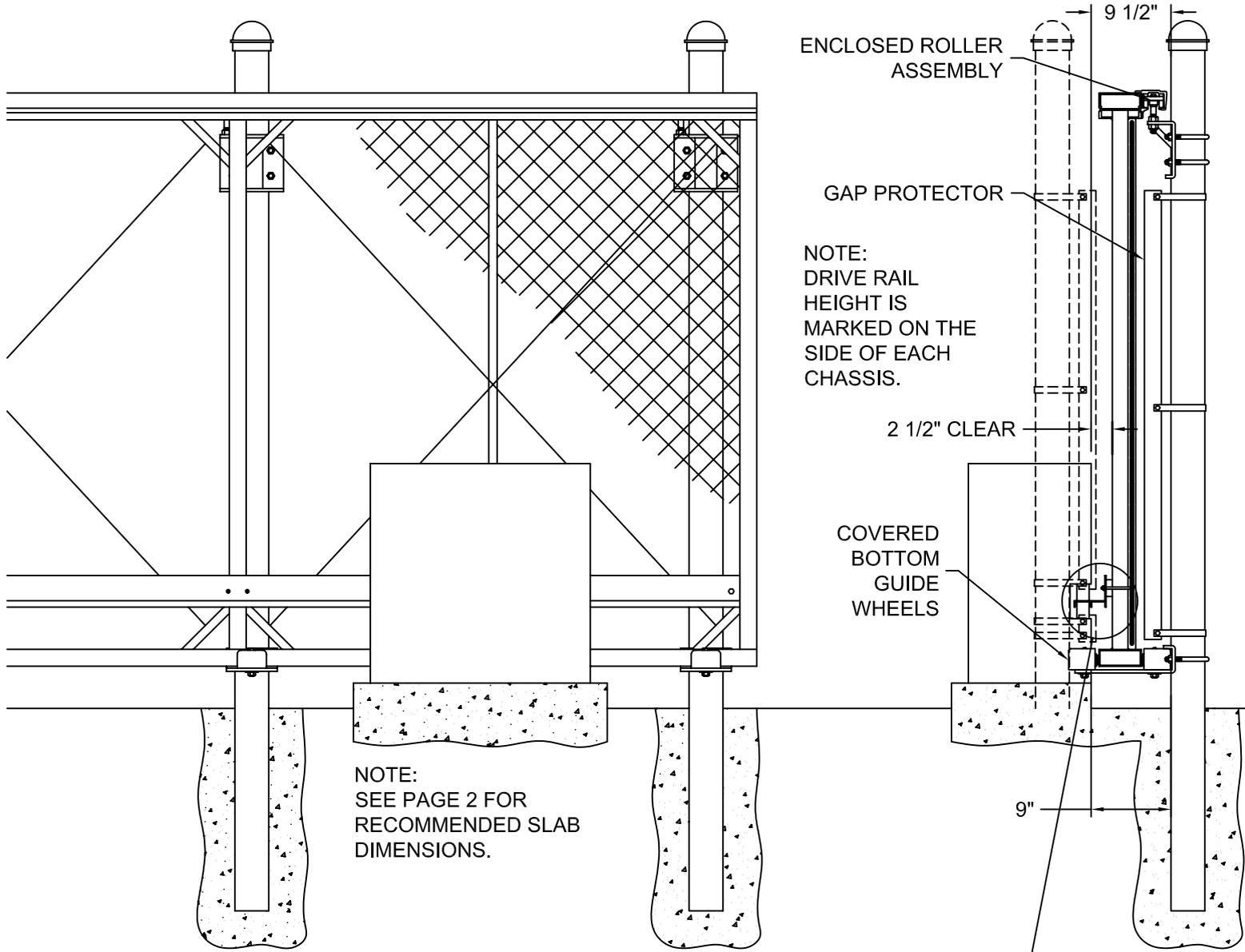
"Right Hand" Hose connections shown

### 4. Pressure Relief Valve

This valve governs the maximum system hydraulic pressure. It is located on the backside of the pump. The pressure relief valve is factory set to 1350 psi, and should not be changed from that setting. If an adjustment is needed, loosen the 9/16" lock nut and turn the adjustment stem with a wrench. Turn the adjuster stem counter-clockwise to lower pressure (force). The only way to display the actual relief valve setting is to unplug the hydraulic hoses from the quick disconnect fittings and run the operator. View the setting on pressure gauge. Retighten the locking nut to hold the desired setting and reconnect the hoses correctly.

Pressure Relief Valve





NOTE:  
SEE PAGE 2 FOR  
RECOMMENDED SLAB  
DIMENSIONS.

ENCLOSED ROLLER  
ASSEMBLY

GAP PROTECTOR

NOTE:  
DRIVE RAIL  
HEIGHT IS  
MARKED ON THE  
SIDE OF EACH  
CHASSIS.

2 1/2" CLEAR

COVERED  
BOTTOM  
GUIDE  
WHEELS

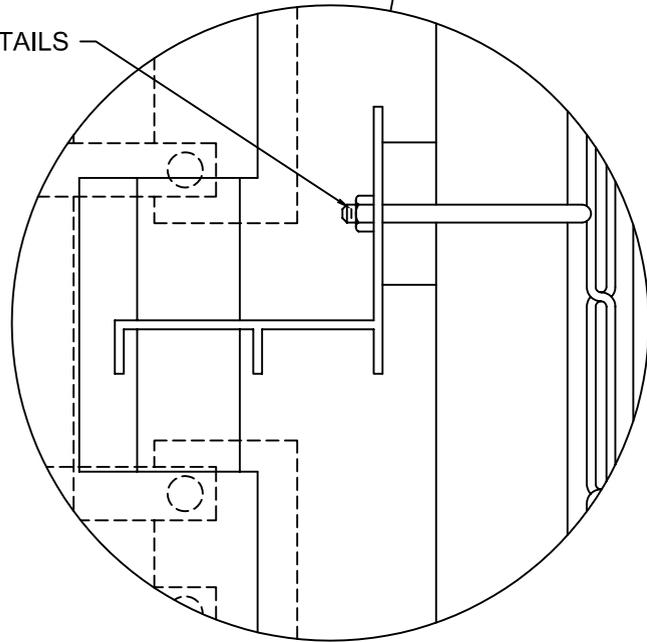
9"

REFER TO SHEET 3 OF 4 FOR DRIVE RAIL ATTACHMENT DETAILS

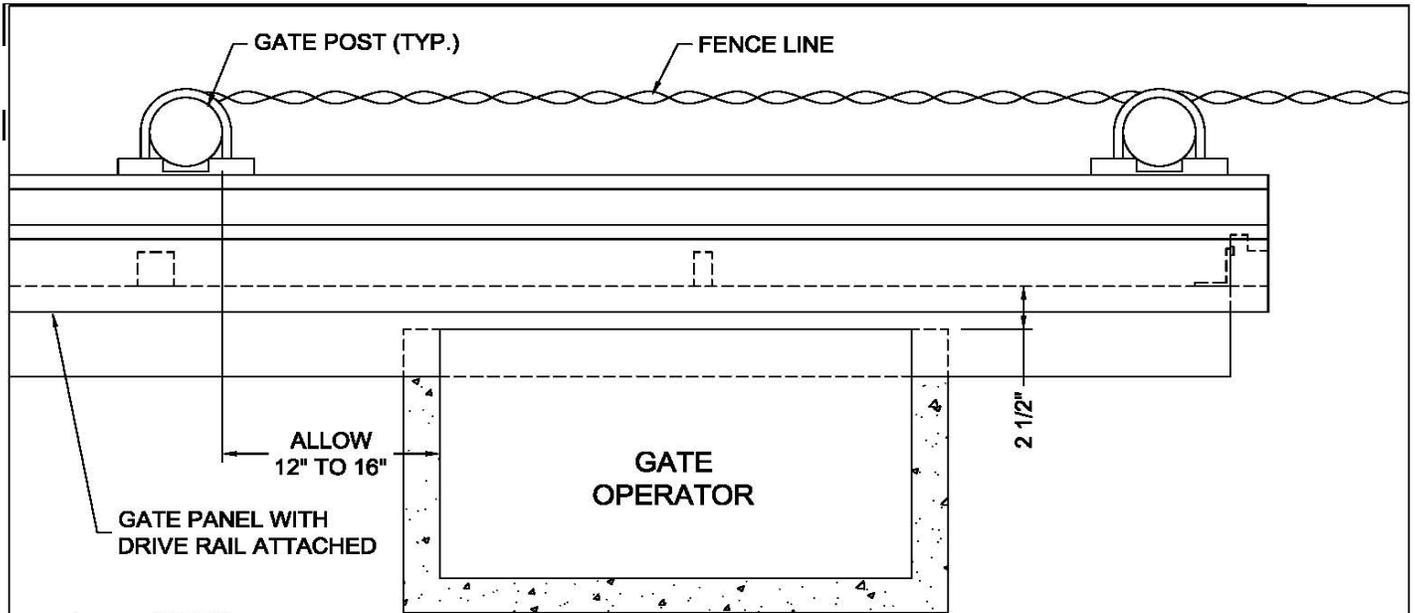
NOTES:  
TYMETAL GATE SYSTEMS ARE SHIPPED WITH GAP  
PROTECTORS AND GUIDE WHEEL COVERS TO COMPLY  
WITH THE REQUIREMENTS OF UL 325 AND ASTM  
F2200-05. ADDITIONAL REQUIREMENTS FOR GATE  
SYSTEM DESIGNERS AND INSTALLERS ARE LISTED IN  
THESE STANDARDS AND CAN BE OBTAINED FROM ASTM  
([www.astm.org](http://www.astm.org)) AND UL 325 (<http://ulstandardsinformatonet.ul.com>).

IT MAY BE NECESSARY TO SHIM THE DRIVE RAIL IF THE  
GATE PANEL IS BOWED. RAIL MUST BE INSTALLED IN A  
STRAIGHT LINE.

REFER TO THE PROJECT SUBMITTAL DRAWINGS FOR  
THE REQUIRED POST SPACING.

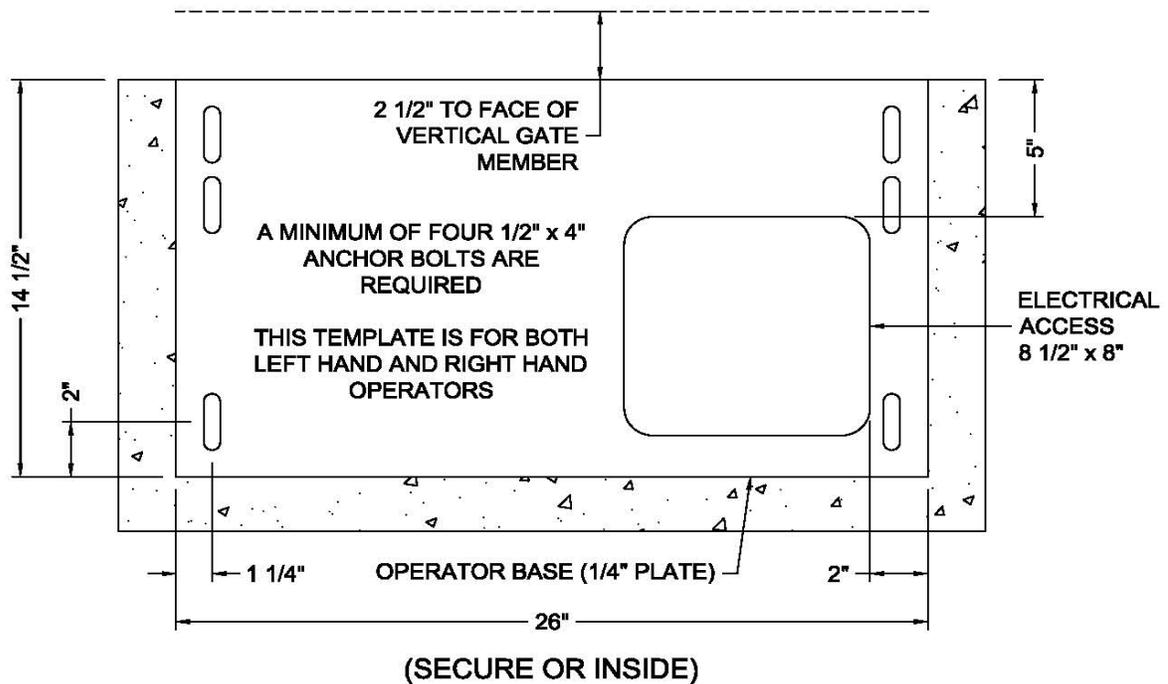


# Slide Gate Operator - Typical Right Hand Drive



**NOTES:**

- TYMETAL'S USE OF EITHER A HEAVY DUTY 2" x 5" OR 5" CHANNEL BOTTOM MEMBER REQUIRES THAT THE OPERATOR BE SET 2 1/2" FROM THE GATES VERTICAL MEMBERS (NOT THE FACE OF THE BOTTOM MEMBER).
- MINIMUM RECOMMENDED SLAB DIMENSIONS ARE 30" x 20" x 16" DEEP. CHECK LOCAL FROST CONDITIONS AND SOIL CHARACTERISTICS FOR THE EXACT REQUIREMENTS IN YOUR AREA.
- THE OPERATOR IS INSTALLED ON A CONCRETE AND IS RIGHT HANDED AS SHOWN. 4" POSTS ARE SHOWN FOR FENCE TERMINATION AND GATE SUPPORT. REFER TO THE PROJECT SUBMITTAL DRAWINGS FOR THE REQUIRED POST SPACING.



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TITLE:  
**Slide Gate Operator - Typical  
Right Hand Drive**

DATE: 9-26-06	DIRECTORY/CAD FILE: 225EX Install R0
DRAWN BY: KEH	SHEET NUMBER: 2 of 2
SCALE: None	DRAWING NUMBER: <b>225EX1-2</b>
REVISION LEVEL: R0	

TYM-FI-013\_R0  
JDE #25978

2 of 4

Issued: 9/26/06

# TYM HYD Gate Operator System

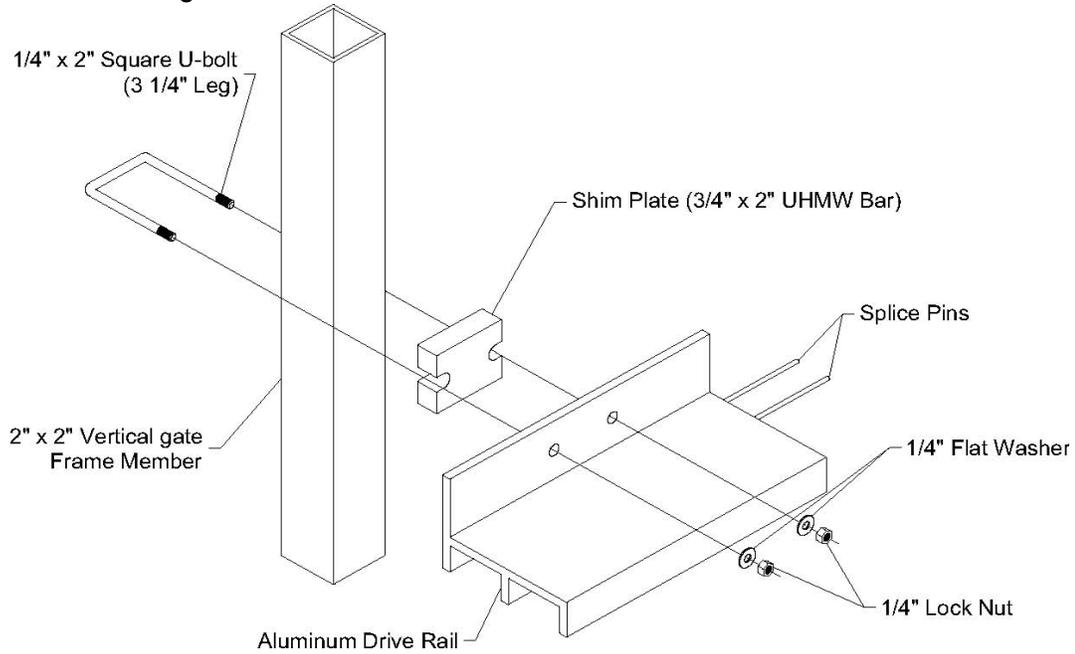
## Recommended Drive Rail Installation Procedure

1. Move gate to the FULL OPEN position.
2. Height of drive rail should be 9 ¼" from top of slab to top of drive rail.
3. Clamp the Drive Rail Mounting Angle to the rear face of leading edge of gate (see End Attachment illustration on the next page) in order to place the top drive rail surface at the correct height established in step #2.
4. Fasten Drive Rail Mounting Angle.
5. Drill ¼" holes and fasten with ¼" drive rivets provided.
6. Disengage the operator drive wheels and insert drive rail.
7. Clamp drive rail to the Drive Rail Mounting Angle at the appropriate height on gate.
  - a. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the top and bottom drive rail surfaces.
8. Move gate toward the CLOSED position until the first 2" x 2" vertical member aligns near the operator.
  - a. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the top and bottom drive rail surfaces.
  - b. Install the U-bolt and Spacer.
  - c. Drill (2) 5/16" holes in the mounting face of the drive rail. Snug the ¼" nuts provided. See End Attachment illustrated on the previous page.
9. Repeat Step 8 at each 2" x 2" vertical member until the end of drive rail is reached.
  - a. NOTE: Splice Pins (10) are provided to connect the ends of the drive rail if required.
10. At the 2" x 2" upright used to terminate the drive rail, mount the other Drive Rail Mounting Angle to the leading face of the upright (see End Attachment illustration on the next page).
  - a. Position and clamp drive rail to the Drive Rail Mounting Angle at the appropriate mounting height on gate.
  - b. Verify that rail height is correct in association with operator drive wheels. Disengaged drive wheels should be the same distance from the drive rail surfaces.
  - c. Drill ¼" holes and fasten with ¼" drive rivets provided.
11. Move the gate toward the OPEN position to re-verify the correct drive rail height at each 2" x 2" upright. Tighten all of the ¼" nuts on the U-bolts as you go.
12. Drill Fasten each end of the drive rail with the 3/8" nuts and bolts provided.
13. Engage the drive wheels, SET LIMITS and test operator.

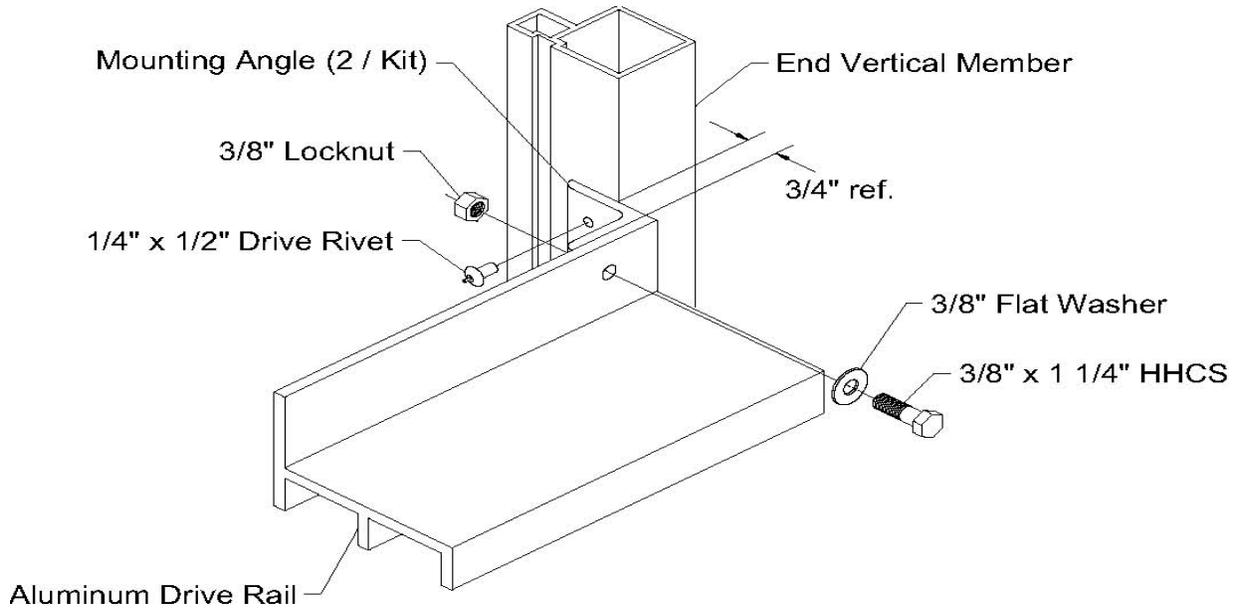
# TYM HYD Gate Operator System

## Drive Rail Attachment

The details below illustrate the standard kit provided by Tymetal to attach the drive rail to the intermediate and end vertical gate members:

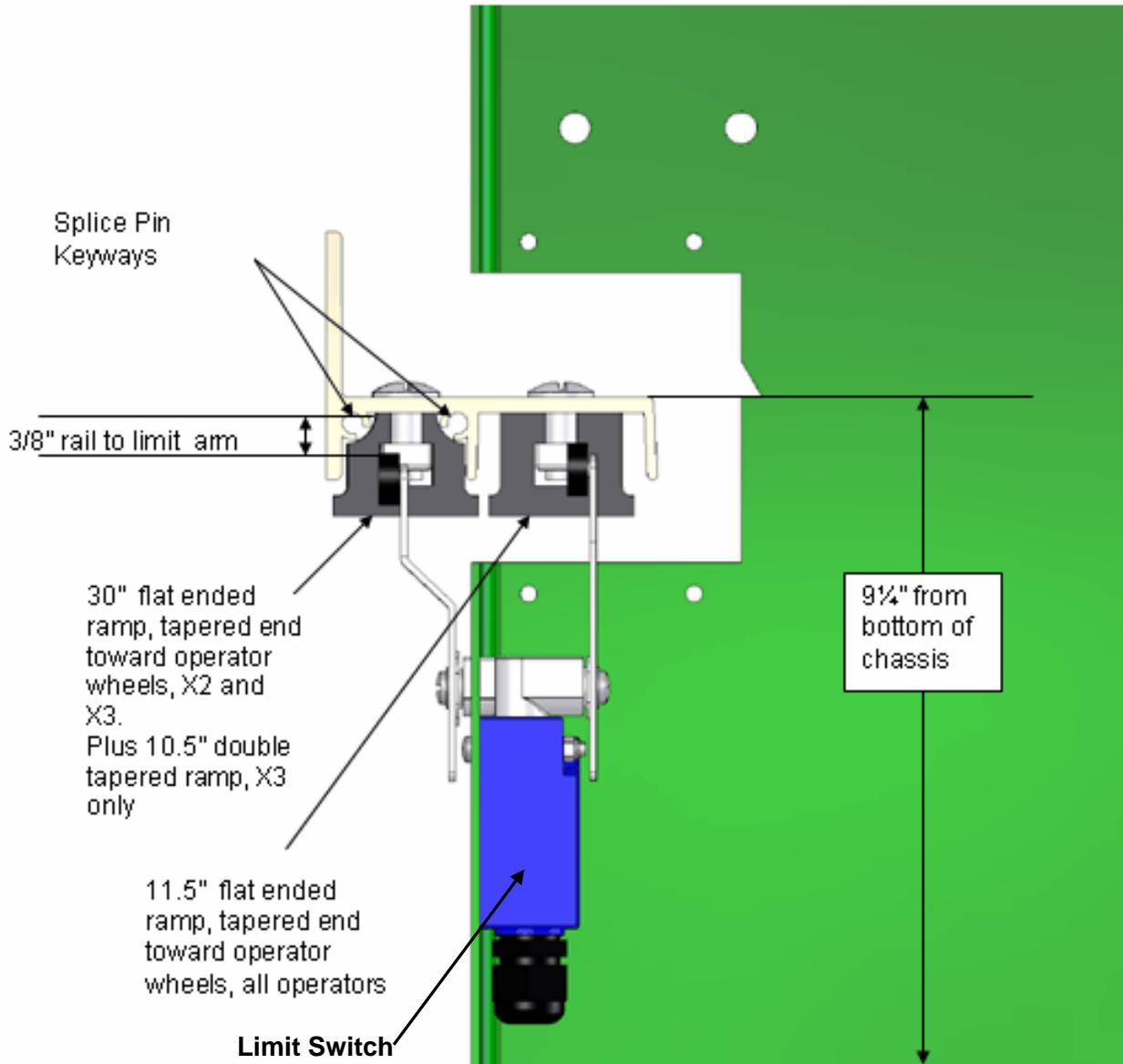


## Intermediate Attachment

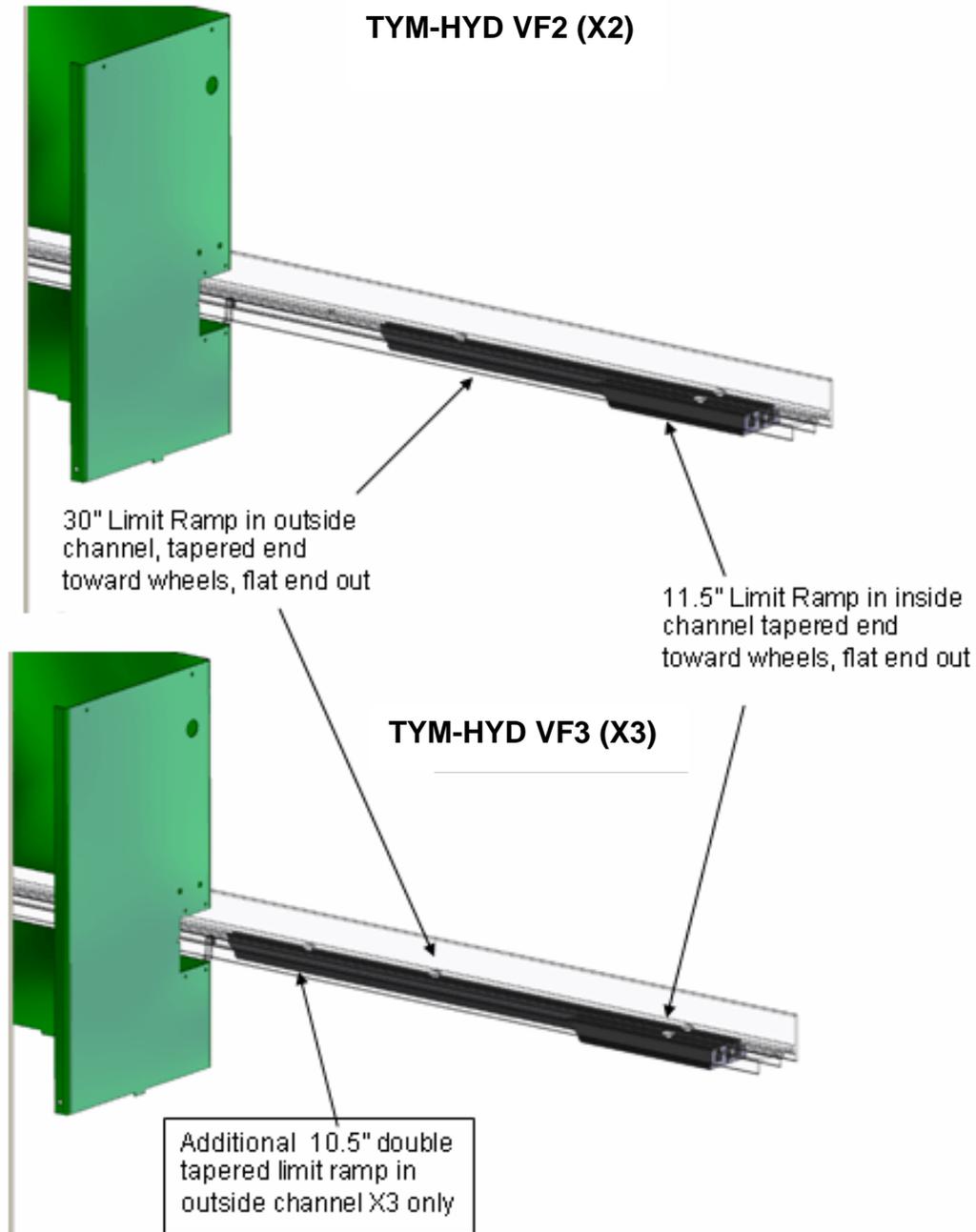


## End Attachment

## Variable Frequency Drive TYM-HYD Limit Switch Placement



# Limit Ramp Configuration



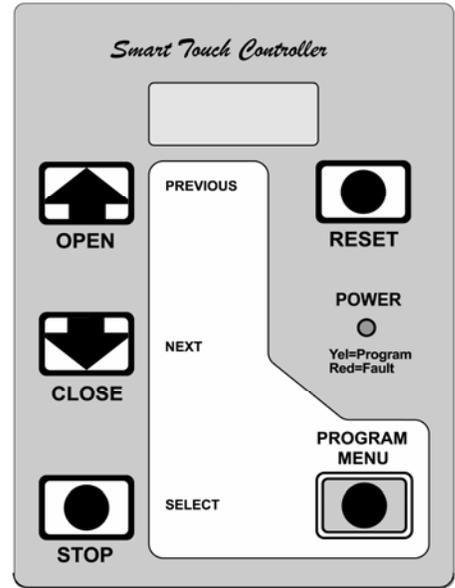
## Smart Touch Basics

Read this page if you are unfamiliar with using the Smart Touch Controller.

You must learn to navigate and change menu settings with the Smart Touch Controller before an installation can be completed or any control settings or function changes can be made.

**Until a new operator has been configured, the controls are not functional and the display is locked in the menu mode until the User Class 1-4, and Left or Right hand use have been selected. See the page 19 for instructions on how make these settings.**

1. There are five buttons on the membrane switch pad that provide total operator control. The Open, Close and Stop buttons serve as a three-button control station, but in Menu Mode, they become Previous, Next and Select buttons. The Program Menu button is used to both enter and exit Menu Mode. The Reset button clears all Errors and Faults and returns the operator to its normal functioning state.
2. When in a Menu Mode, changes to be made to a Menu setting are accomplished by pressing the Previous, Next and Select buttons in the following sequence:
  - a. Press the Next button to move forward through the list of available menu items, as shown on pages 25 and 26, or press the Previous button to move back an item.
  - b. Press the Select button to select a menu item to change. The menu item will flash to indicate that its setting is ready to be changed.
  - c. Press Next to move forward or Previous to go back through available settings.
  - d. When you have located the new setting that you want to use, press the Select button and the program accepts the change and stops blinking.
  - e. The Program Menu button does not allow an Exit to Run while a selection is still blinking. Press the Select button to confirm the new setting and stop the blinking. Then exit to Run Mode.
  - f. Pressing the Next or Previous buttons when the menu item is not blinking moves to the next or previous menu item.
  - g. When done, press Program Menu to exit to Run Mode.
3. Once configured, the operator is in the Run Mode. To gain access to the User Menu or the Installer Menu from the Run mode, follow these steps:
  - a. Note that the Program Menu button will not function unless the gate is at rest, no open or close inputs are active and the operator is not showing a Fault, Alert or Error. Verify system status by viewing lighted (active) inputs. Active inputs are lighted on this and all "New Generation" (post September 2006) Smart Touch operators (other than DC operators without AC power). Verify active inputs on New Generation DC operators (running without AC power) and "Classic" pre-September 2006 operators, by pressing the tact button on the Smart Touch Controller (see page 23). If necessary, clear Alerts, Faults or Errors by pressing the Reset button on the Smart Touch Controller membrane switch.



- b. Press the Program Menu button and watch the LCD scroll the system data, or press the Program Menu key a 2<sup>nd</sup> time to skip the scroll. The scrolled data displays the information in the table on page 25.
  - c. The LCD display scroll will stop at the menu item for the automatic close timer setting [Ct \_\_]. This is the first item in the User Menu.
  - d. To access the more detailed Installer Menu, first go to the User Menu. Then press and hold the Reset button and while holding, press the Open button. The LCD will change to display the UL usage class menu item [uC \_\_] This is the first item in the Installer Menu.
4. Pressing the Program Menu button when the User or Installer Menu is not blinking will return the system to the Run Mode.

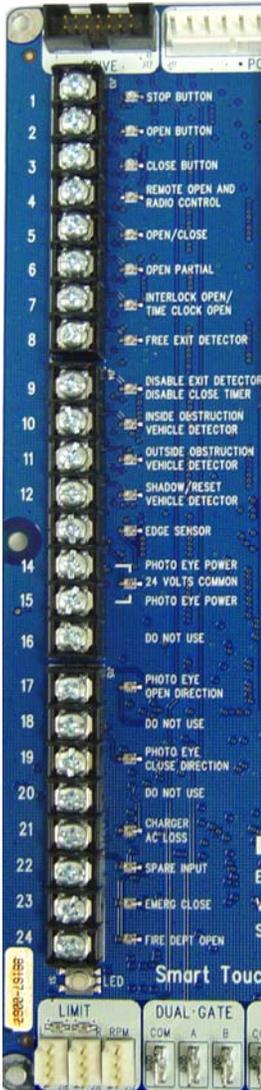
## Installation Configuration for Smart Touch Controller

### Setting Operator Handing and Usage Class

1. Connect the hydraulic hoses to the quick couplers on the pump in order to configure left or right hand opening function (as viewed from the secured side of the gate). There is a label near the connection point describing this procedure. Also see the illustration on page 12. If the hoses are connected incorrectly, the gate will run backwards (close when open button is activated) and this may trigger an error [Err 1] on the LCD display. (The Reset button must be pushed if this happens).
2. Turn on the power switch and observe that the LCD will first show the software version, and then stop at a steady display within two seconds. If the display reads [uC 0] go to step 3. If the operator has previously been configured, the Installer Menu must be accessed in order to reach the system configuration menu items: See step # 3d on the previous page.
3. When turning on the power for a new machine, the LCD display directly enters the Installer Menu at the [uC \_\_\_] menu item, which is for selecting the user class as defined by UL. Select [uC 1] - [uC 2] - [uC 3] or [uC 4] depending upon the use application. See page 34 for UL usage class definitions.
4. To set the operator handing, use the "Next" button and move one click down the menu to item [Sh \_\_\_] Enter r for right hand or L for a gate that opens to the left. Never alter the limit switch mounting or change the order of their connection to the controller board. At this point you should exit the Installer Menu, by pressing the Program Menu button. The LCD display jumps to the close timer [Ct\_\_\_] setting in the User menu, which may now be set. Either press the Program Menu button again to exit to normal run mode or set the close timer by the same programming sequence described at the previous page.
5. **Note that the Installer menu cannot be exited by any means until the selection for UL usage class [uC \_\_\_] and the selection for gate handing [Sh \_\_\_] have been entered.**
6. Test for normal function of the gate operator, with the wheels unclamped, by running it both open and closed from the pushbuttons on the membrane switch pad. Neither limit switch should be triggered at the start of this test or an alert [ALE6] may trigger because the control did not sense gate motion. If this occurs a new input will restart the motor.

## Wiring Control Inputs

1. Test open and close before wiring the external control inputs. This makes it easier to troubleshoot if an unexpected functionality arises. Smart Touch Operator inputs use an LED to indicate when it is active. This button is in bottom corner near the Fire Department Open input.
2. All the control device inputs listed below are shown as a single input. The 2nd wire is connected to the Common Terminal Buss on the Power Supply board. The Emergency Close and Fire Dept. Open inputs are an exception and require a +24 Volt input. The +24 is located on the spade terminals next to the Common Buss. See pictures on the next page.



### Smart Touch Controller Inputs

1.	<b>*Stop Push button</b> N.C. input, jumper to Common if unused
2.	<b>*Open Push Button</b> Not for radio or remote access controls
3.	<b>*Close Push button</b> Not for radio or remote access controls
4.	<b>Remote Open &amp; Radio Control</b> For radio / remote open device – Program to also Close using Smart Touch menu
5.	<b>Open/Close button</b> Pushbutton or radio controls
6.	<b>Partial Open</b> Installer adjustable from 7- 99 seconds
7.	<b>Open interlock input or Time clock Open</b> Menu configurable
8.	<b>Free Exit vehicle detector</b>
9.	<b>Disable Free Exit vehicle detector or Timer to Close</b> Free Exit is only disabled if Close Limit Switch is tripped. If the gate is partially opened, the Free Exit detector will trigger the gate to open fully.
10.	<b>Inside Obstruction vehicle detector</b> Inside reversing loop
11.	<b>Outside Obstruction vehicle detector</b> Outside reversing loop
12.	<b>Shadow/Reset vehicle detector</b> Shadow function used for Swing gates only - Reset function is for Arm gates
13.	<b>Edge Sensor</b> One input works for both travel directions
14-15.	<b>Photo eye Common Power</b> 24V common connection for open and close photo eyes
17.	<b>Photo eye Open direction</b>
19.	<b>Photo eye Close direction</b>
21.	<b>Charger AC power loss</b> Only used in DC, battery type operators
22.	<b>Spare Input</b> Software ≤ h3.26,- non functional, <b>Gate Lock Interlock Input</b> Software > h3.26, prevents start until external gate lock releases
23.	<b>**Emergency Close</b> Must menu enable and input +24 Volts to trigger. Requires constant hold or maintained input. This overrides photo eyes, gate edges & vehicle detectors.
24.	<b>**Fire Dept. Open</b> Must menu enable and input +24 Volts to trigger. Overrides photo eyes & gate edge.



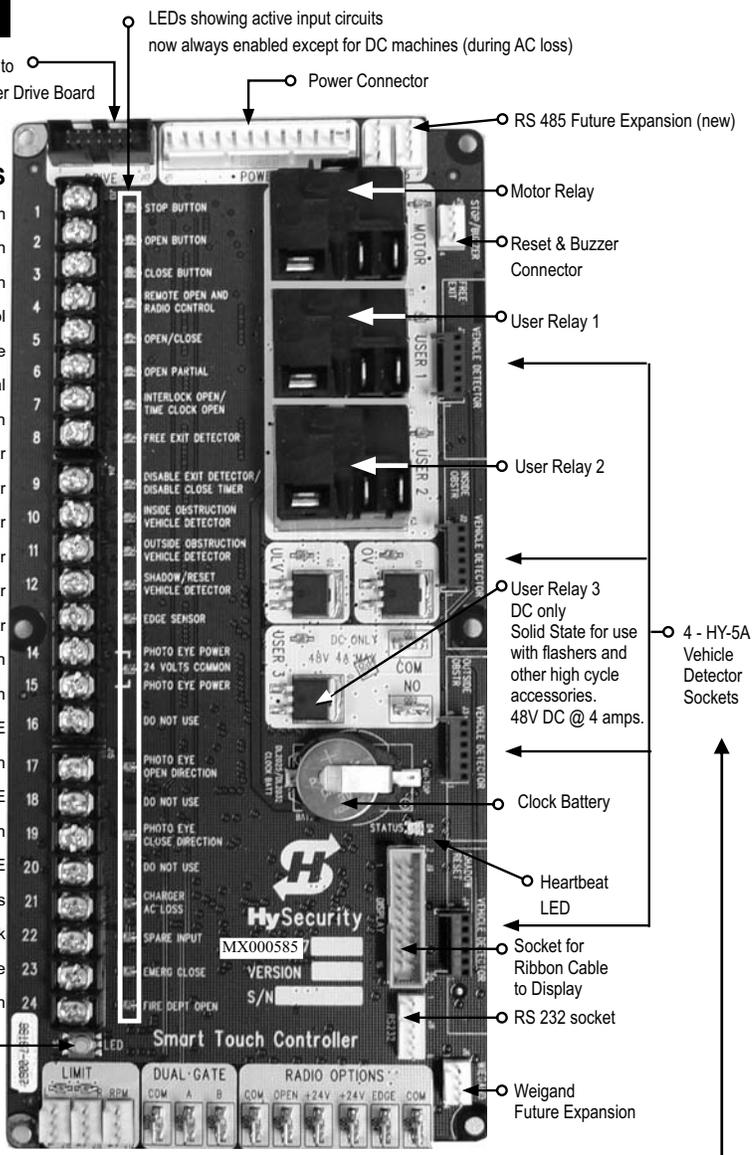
\*Do not connect an external control to terminals #1, 2 or 3, unless controls are located in clear view of the entire gate area. Out of sight controls: use input terminals #4, 5, 6 or 7.

\*\*The Emergency Close and Fire Dept. Open inputs are to be used only if access to these controls is guarded such that there is always supervision when activated.

**“New Generation” Smart Touch Board**

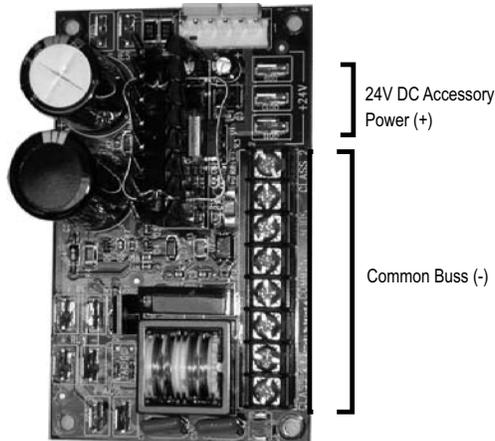
Runs software 4.xx and higher

- INPUTS**
1. Stop Button
  2. Open Button
  3. Close Button
  4. Remote Open & Radio Control
  5. Open / Close
  6. Open Partial
  7. Interlock Open / Time Clock Open
  8. Free Exit Detector
  9. Disable Exit Detector / Disable Close Timer
  10. Inside Obstruction Vehicle Detector
  11. Outside Obstruction Vehicle Detector
  12. Shadow / Reset Vehicle Detector
  13. Edge Sensor
  14. Photo Eye Power (-) 24 Volts Common
  15. Photo Eye Power (-) 24 Volts Common
  16. DO NOT USE
  17. Photo Eye Open Direction
  18. DO NOT USE
  19. Photo Eye Close Direction
  20. DO NOT USE
  21. Charger AC Loss
  22. Gate Lock Interlock
  23. Emergency Close
  24. Fire Department Open



Tact button. Push tact button to make active input LEDs light up when AC is off on DC operators.

**Power Supply Board**



24V AC Accessory power

**HY-5A Vehicle Detector**

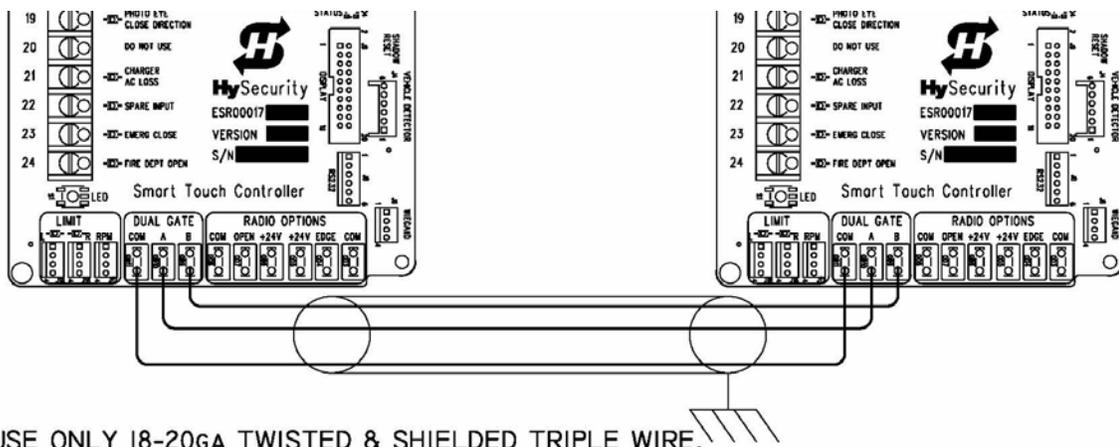


## Connecting a Master / Slave Pair

Configuring two operators to be a Master and Slave pair is easy with the Smart Touch Controller. There is no need to order a special model or any adapters. The area of the board marked Dual Gate employs a 3-wire RS485 serial port for communication between Master and Slave operators.

**Note:** Master and Slave operators must have the same version of the Smart Touch Controller and the same software version loaded on both machines.

1. An electrical conduit for the interconnecting wires must span between the two operators. This conduit must contain only low voltage  $\leq 24V$  control and signal wiring.
2. Complete the installation of both of the operators as separate machines and verify that their basic functions are correct as solo operators before interconnecting them.
3. The two gate operators should be supplied by home runs from separate 20 Ampere circuit breakers in the main panel, but if there is only one circuit, be absolutely certain that the breaker and wire size is sufficient for the load of two motors. See the Appendix.
4. External control inputs, vehicle detectors and entrapment protection sensors may be connected to either gate operator without regard to preference.
5. To interconnect the two operators, route a shielded twisted triple cable between the electric control boxes and connect to the RS485 Dual Gate terminals, in matching order on both machines: In the RS485 shaded area connect the terminals for Master Com to Slave Com, Master A to Slave A and the Master B to Slave B using the insulated trio of wires. Connect the shield to a solid ground at either the Master or the Slave unit (Do not ground both ends). Cut off the shield and insulate (tape up) the exposed strands at the other operator.
6. The Installer Menu in each machine must be set as a Master or a Slave under menu item [dg\_]. Set one operator as a Slave [dg\_1] and the other as a Master [dg\_2]. If the function of any external input is to be different than the factory default, configure for the desired function on the operator where that input is connected. Internal functions, such as the close timer or reversal distance, are controlled by the Master operator regardless of the settings in the Slave.
7. Once set as a Master or a Slave the operators will be in constant communication with each other. If that communication stops because the wires become severed or one operator is turned off, both machines will cease functioning and the LCD will display Err4, which is a Master/Slave communication error. This error cannot be reset until both machines are functional and communicating properly again.



## Smart Touch User Menu Functions

**Initial Power Up** – When power is turned on, the display will disclose the software revision:

Display Revision Number	2s delay	Displays software version Number, ex. [h2.17]
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### System Data and accessing the User Menu Settings:

If the gate is stopped in the Run Mode, pressing of the **Menu button** accesses the User Menu. After the menu button is pressed, the LCD will scroll the system data in the table below. The scrolling display stops at the close timer setting, which is the beginning of the User Menu. To exit the Menu Mode, the display must not be blinking, then simply pressing the Menu button will return the display to the Run Mode and re-enable the controls. The menu mode will also automatically return to the Run Mode if there is no activity for two minutes.

	Data Displayed in Scroll	Time	Description
S1	[SLAu] or [LEAd]	2s	SLAVE Operator or LEAd Operator (master)
S2	[ot 1] Gate type (1-5)	2s	Operator type: 1 =HSG, 2 =HRG, 3 HVG, 4 =HTG
S3	[ rh ] or [ Lh ] Hand setting	2s	Displays hand configuration [ rh ] or [ Lh ]
S4	[uC ] UL usage class (1-4)	2s	Installer setting of usage class: type 1-4
S5	[d ] 24VDC Buss Voltage	2s	Actual VDC buss voltage
S6	[CC ] Life cycle counter	2s	High digits of 6 digit life cycle counter
S7	[ ] Life cycle counter	2s	Last 4 digits of 6 digit life cycle counter

Read through the options available in the User Menu and the Installer Menu on the next page and you can see that the functions of this gate operator can be configured to suit most any specific need. Once you have learned to navigate the menus, as described in #3 on page 19 and how to change a setting, as described in #3 & #4 on page 21, the full range of features and choices of the Smart Touch Controller are available to use. The User Menu contains the basic configuration items and the Installer Menu contains the more advanced menu items.

	User Menu Options	Default	Description
U1	[Ct 0] Close timer setting	0	0 = Close timer off or 1 – 99 seconds
U2	[hC 0] Momentary Close	0	0 = momentary, 1 = Constant hold Close PB required
U3	[ho 0] Momentary Open	0	0 = momentary, 1 = Constant hold Open PB required
U4	[AP 0] Power loss function	0	0 – 3 (0=Type A, 1 = B, 2 = C, 3 = D)
U5	[ro 0] Radio control option	0	0 = Open only, 1 = Adds close ability when full open
U6	[bF 2] Warn before operate	2	0 =off, 1 = Buzzer alerts 3 seconds before + in motion, 2 = Buzzer alerts 3 secs before + 2 seconds in motion
U7	[FA 0] Forced open Alert and automatic gate reposition	0	0 = disabled, 1 = sound buzzer (2 pulses/sec) if forced open for more than four seconds, time out in 30 Sec
U8	[dA 0] Drift Closed Alert and automatic gate reposition	0	0 = disabled, 1 = sound buzzer (2 pulses/sec) if drift closed and cannot reopen within four seconds.
U9	[PE 0] Photo Eye Align Mode	0	0= off, 1 = on (auto off when close limit triggered)
U10	[CL 0] Clock set (24 hour type)	0	0= display, 1= set mins, 2= set hours, 3= day, 4= month
U11	[Ld 5] LCD Contrast set	5	1 - 9 = Adjusts contrast of the display
U12	[dS 0] Data Log (New Gen only)	0	0 = Std. 1 = Extended (reset to 0 in 24 hr) (V4.xx software)

### These Notes Refer to the Menu Above:

- S1 Appears only if the operator is configured as a master or a slave unit
- U1 Close timer setting does not appear when set for constant contact close function
- U4 Power loss function only appears if factory has provided DC battery type operator
- U6 We strongly advise never disabling the Warn Before Operate buzzer.

## Smart Touch Installer Menu Functions

The Installer Menu can be accessed only by entering the User Menu first, and then by **pressing the Reset button and the Open button** simultaneously (some older software requires the Reset button be pressed first and held while the Open button is pressed).

**To restore the factory default settings, go to menu item [Fd\_0] and change the setting to 1, then press the Program Menu button. The entire menu will reset to the factory defaults.**

	Installer Menu Options	Default	Description
I1	[uC 0] Set UL Usage Class	0	0 = gate disabled, Set Class 1 through 4 use
I2	[Sh 0] Set Handing of gate	0	0 = gate disabled, r = Right Hand, L = Left Hand
I3	[Fd 0] Load Factory Defaults	0	0 = User settings, 1 = Load defaults (resets full menu)
I3a	[bu 0] Choose Buzzer	0	0 = Buzzer not set, 1 = Freq 1, 2 = Freq. 2
I4	[dg 0] Set Master/Slave type	0	0 = solo operator, 1 = Slave unit, 2 = Master unit
I5	[Ch 0] Set AC Charger or Solar	0	0 = DC + AC charger 1 = DC + Solar charger
I6	[Fo 0] Enable Fire Dept. Open	0	0 = disabled, 1 = enabled
I7	[oC 0] Enable Emergency close	0	0 = disabled, 1 = enabled
I8	[SE 3] Inherent Sensor sens.	3	1 = maximum sensitivity, 9 = Lowest sensitivity
I9	[SS 0] Inherent Sensor function	0	1 = stop only (note, functions in usage class 4 only)
I10	[LC 0] Leaf delay Close	0	0 = none (1-7) ½ second steps (Master/Slave only)
I11	[Lo 0] Leaf delay Open	0	0 = none (1-7) ½ second steps (Master/Slave only)
I12	[rt 0] Maximum run timer	0	0 = 60 Seconds max run, 1 = 300 Seconds max run
I13	[Po 0] Partial Open distance	0	0 = none, or 7 – 99 seconds
I14	[EC 0] PEC reverse to open	0	0 = Close eye stops only, 1 = 2 sec reverse to open
I15	[EO 0] PEO reverse to close	0	0 = Open eye stops only, 1 = 2 sec reverse to close
I16	[gr 0] Edge reverse to open	0	0 = Edge reverses fully open, 1 = 2 sec reversal only
I17	[Sr 1] IES reverse to open	1	0 = IES reverses fully open, 1 = 2 sec reversal only
I18	[PC 0] Set PEO/ PEC – NO/NC	0	0 = Normally Open PE output, 1 = N.C. (supervised)
I19	[gC 0] Set Edge input – NO/NC	0	0 = Normally Open Edge output, 1 = Normally Closed
I20	[tC 1] Time clock/ Interlock input	1	0 = select Time Clock, 1 = select Open Interlock
I20a	[dt 0] Disable Free Exit/Close Tmr	0	0 = disable Free Exit, 1 = disable Close Timer
I21	[or 1] OOLD detector function	1	0 = pause closing only, 1 = enable reversing to open
I22	[ir 1] IOLD detector function	1	0 = pause closing only, 1 = enable reversing to open
I23	[dL 1] Vehicle detector logic	1	1 = std, 2 & 3 = quick close, 4 = full anti-tailgate*
I24	[r1 0] User relay 1 option	1	0 = disabled, 1 – 24 = see output options page 29–30
I25	[r2 0] User relay 2 option	6	0 = disabled, 1 – 24 = see output options page 29–30
I26	[r3 0] User relay 3 option	1	0 = disabled, 1 – 24 = see output options page 29–30
I27	[t L 0] Gate Open alert	2	0 = 0 sec, 1=15s, 2=45s, 3=75s, 4=105s, 5=135s
I28	[Lt 0] Loitering alert	3	0 = 0 sec, 1=15s, 2=45s, 3=75s, 4=105s, 5=135s
I29	[SA 0] System Address	0	0 = Off, 1-99 = RS-485 Slave Address
I30	[ELd0] Test factory ELD*	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I31	[iLd0] Test factory IOLD*	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I32	[oLd0] Test factory OOLD*	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I23	[SLd0] Test factory SLD*	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7

\*See page 45 for description of Vehicle Detector & Loop Fault diagnostics

### These Notes Refer to the Menu Above:

- I1, I2, I3a These settings must be configured or the gate cannot function and menu will not exit.
- I3a The Option bu=0 only appears if the Controller has been reset to factory default settings,
- I5 These settings appear only if the factory has provided a DC powered gate operator
- I9 IES stop only setting [SS \_\_\_] does not appear unless set as a class 4 operator
- I10, I11 These settings appear only if the Installer Menu is set for Master / Slave function
- I27, I28 These settings appear only if the Installer Menu has set relays r1-r3 for these alerts

## User Menu Functions

**User 1 [Ct \_] Close timer setting:** This menu item is the automatic close timer for the gate. The factory setting is zero, which is off. It may be configured up to 99 seconds.

**User 2 [hC 0] Momentary Close:** This menu item is to configure the system for constant hold push button Close function. The factory setting is zero, which is momentary contact input.

**User 3 [ho 0] Momentary Open:** This menu item is to configure the system for constant hold push button Open function. The factory setting is zero, which is momentary contact input.

**User 4 [AP 0] Power loss function:** This menu item only appears if the operator is a DC battery powered version. This item is to configure what gate function will occur when the AC power fails.

**User 5 [ro 0] Radio control option:** This menu item is to configure whether a radio input can open only (default) or if set to 1, also have the ability to close the gate when it is fully open.

**User 6 [bF 2] Warn before operate:** This menu item controls the warn before operate buzzer and can be configured three ways. Setting the menu item to zero turns the buzzer off, but we strongly advise leaving this valuable warning feature active to alert prior to gate motion. **Never cut the wires to the buzzer or unplug it.** Set to 1 and the buzzer will sound three seconds before motion and the entire time during gate motion. Set to 2 (default) and the buzzer will sound three seconds before motion and for the first two seconds of motion.

**User 7 [FA 0] Forced open Alert and automatic gate reposition:** This function is intended for highly secure facilities. If it is enabled, by setting the selection to 1, it will reinitiate a closure if a gate is somehow forced to open far enough that the close limit switch releases. The Alert buzzer will sound immediately, even if it had been turned off, and the motor will restart to secure the gate fully closed. If the gate is not fully closed within four seconds the motor turns off and the alert buzzer sounds an intruder alert for thirty seconds. The LCD display reads ALE1.

**User 8 [dA 0] Drift Closed Alert and automatic gate reposition:** If it is enabled, by setting the selection to 1, it will restore a gate to back its fully open position if it drifts closed for any reason. The buzzer will sound a warn before operate alert, even if it had been turned off, and the motor will restart to reopen the gate. The motor will run for a maximum of four seconds and if the gate is not fully open in this period, the buzzer sounds for ten seconds and the LCD display reads ALE2.

**User 9 [PE 0] PE Alignment Mode:** This feature may be activated as an aide to photo-eye emitter / receiver alignment. The buzzer chirps once as the photo eye is triggered or twice when the photo eye is released. The Alignment Mode is cancelled with any close limit input or reset input.

**User 10 [CL 0] Clock and date set:** The Smart Touch Controller is equipped with a 24 hour 365 day clock, so that events of significance can be logged and stamped with the time and date. This feature is useful to record historical operation data, which can be accessed via the RS232 port. To set or adjust the hour, minute, day or month, see page 32.

**User 11 [Ld 5] LCD Contrast set:** Under some extreme high or low temperature conditions, it may be necessary to adjust the contrast of the LCD display. The display is adjustable from 0-9 with a factory default setting of 5.

**User 12 [dD 0] Extended Data Log:** When set to 1, the ST Controller logs nearly all Smart Touch Controller events, in addition to the normal alert, fault and error logs. This parameter automatically resets to 0 after 24 hours – (Requires New Generation Smart Touch board and version 4.xx software)

## Installer Menu Functions

**Installer 1** [uC 0] **Set UL Usage Class:** This menu item is used to set the UL usage class, which must be set by the installer before the operator will function. See page 21, step 3.

**Installer 2** [Sh 0] **Set Handing of gate:** This menu item is used to set the gate handing, which must be set by the installer before the operator will function. See page 21, step 4.

**Installer 3** [Fd 0] **Load Factory Defaults:** This menu item is used to globally restore all menu settings back to new machine status. To activate, change the setting from 0 to 1 and push the Menu button. The UL usage class, the hand configuration and the buzzer type will need to be set again.

**Installer 3a** [bu 0] **Select Buzzer Type:** This menu item selects the type of audible buzzer installed on the machine. To set, push SELECT on the keypad, the display will flash 0, push OPEN and note the buzzer volume. Push OPEN again and note the buzzer volume. If this tone is louder, push SELECT, if the first tone was louder, push CLOSE for the louder tone, then push SELECT to lock in the louder tone.

**Installer 4** [dg 0] **Set Solo, Master or Slave type:** This menu item is used to configure an operator as a Master or a Slave operator in Master/Slave paired gate installations.

**Installer 5** [Ch 0] **Set AC Charger or Solar:** This menu item appears on 24 VDC battery machines only and is set to solar only when there is no AC battery charger.

**Installer 6** [Fo 0] **Enable Fire Dept. Open:** This menu item is used to enable the Fire Department Open input. When set to [Fo\_1] this input will override vehicle detectors, photo eyes and gate edges to open a gate. A reset (or two open commands) is required before the gate can be closed.

**Installer 7** [oC 0] **Enable Emergency Close:** This menu item is used to enable the Emergency Close input. When set to [oC\_1] this input will override vehicle detectors, photo eyes and gate edges to close a gate. A reset is required before the gate can be opened.

**Installer 8** [SE 3] **Inherent Sensor sensitivity:** This menu item is to adjust the sensitivity of the internal inherent sensor. Available settings are 1-9, with 9 being the least sensitive.

**Installer 9** [SS 0] **Inherent Sensor function:** This menu item is only available in UL class 4 operators and allows an option whereby the inherent sensor will only stop the gate.

**Installer 10** [LC 0] **Leaf delay Close:** This menu item only appears if the operator is set up as a Master or a Slave. Available settings are 1-7. Each increment adds ½ second, to a maximum of 3 ½ seconds time delay, before the operator activates when commanded to close.

**Installer 11** [Lo 0] **Leaf delay Open:** This menu item only appears if the operator is set up as a Master or a Slave. Available settings are 1-7. Each increment adds ½ second, to a maximum of 3 ½ seconds time delay, before the operator activates when commanded to open.

**Installer 12** [rt 0] **Maximum run timer:** The maximum run timer has a default setting of 60 seconds. This menu item allows an optional setting of 300 seconds, if changed to [rt\_1].

**Installer 13** [Po 0] **Partial Open distance:** This menu item both activates the partial open input and allows an adjustable distance by setting the open duration. The available time settings are 7-99 seconds. The default setting of [Po\_0] leaves this input inactive.

**Installer 14** [EC 0] **PEC (photo eye close) reverse to open:** The default for this menu item is for non-reversal if the close photo eye is triggered. The optional setting of [EC\_1] will cause the gate to reverse to open for two seconds if triggered while closing.

## Installer Menu Functions – continued

**Installer 15** [EO 0] **PEO (photo eye open) reverse to close:** The default for this menu item is for non-reversal if the open photo eye is triggered. The optional setting of [EO\_1] will cause the gate to reverse to close for two seconds if triggered while opening.

**Installer 16** [gr 0] **Edge reverse to open:** Default for this menu item is a 2 second reversal if the gate edge is triggered. The optional setting of [gr\_1] causes the gate to reopen fully if triggered while closing.

**Installer 17** [Sr 1] **IES (inherent sensor) reverse to open:** The default for this menu item is for a 2 second reversal if the inherent sensor is triggered. The optional setting of [Sr 0] will cause the gate to reopen fully if triggered while closing.

**Installer 18** [PC 0] **Set PEO/ PEC – NO/NC:** The default for this menu item is for photo eyes with Normally Open outputs. The optional setting of [PC\_1] will require a Normally Closed output. If set for NC the connection is also supervised and any open or short circuit fault will generate a FAL2 alert, which requires a Stop button reset to re-enable any function if triggered.

**Installer 19** [gC 0] **Set Edge input – NO/NC:** The default for this menu item is for edge sensor with Normally Open outputs. The optional setting of [gC\_1] will require a N.C. output.

**Installer 20** [tC 1] **Time clock / Interlock input:** This menu item configures the input at terminal #7 to be either for the gate interlock function, as described on page 31, or for an external time clock to open input, as described on page 47. The default setting is [tC\_1] for the interlock function.

**Installer 20a** [dt 0] **Disable Free Exit / Close timer:** This input configures the input at terminal #9 to disable either the Free Exit Detector on terminal #8, or the Timer To Close function. Default setting is [dt 0] allowing disabling of the free exit detector. NOTE: The free exit is disabled using this menu item when the operator is sitting on its closed limit. If the closed limit is not tripped, the free exit continues to work.

**Installer 21** [or 1] **OOLD (Outside Obstruction Loop Detector) function:** The default for this menu item is for full reversal when the OOLD is triggered. The optional setting [or\_0] causes the gate to only pause when triggered. Closure begins as soon as the loop is clear again.

**Installer 22** [ir 1] **IOLD (Inside Obstruction Loop Detector) function:** The default for this menu item is for full reversal when the IOLD is triggered. The optional setting [ir\_0] causes the gate to only pause when triggered. Closure begins as soon as the loop is clear again.

**Installer 23** [dL 1] **Vehicle detector logic:** This menu item is used to configure quick close and anti-tailgate logic. There are four modes. See the full description on page 47.

**Installer 24, 25, 26** [r1 0], [r2 0], [r3 0] **User output relay 1 - 3 options:** These three menu items are used to configure the function of the three user output relays. There are 21 optional choices, which are described in detail on page 31.

**Installer 27** [t L 0] **Gate Open alert:** This menu item is to adjust the time delay before activating the user relay function #8, described on page 31. Time settings up to 135 seconds.

**Installer 28** [Lt 0] **Loitering alert:** This menu item is to adjust the time delay before activating the user relay function #13, described on page 31. Time settings up to 135 seconds.

**Installer 29** [SA 0] **System Address:** This menu item controls the system address of the STC. when communicating over the RS-485 to other systems.

**Installer 30** [ELd0] **Factory ELD:** Controls the HY-5A Free Exit detector, see page 45.

**Installer 31** [iLd0] **Factory IOLD:** Controls the HY-5A IOLD detector, see page 45.

**Installer 32** [oLd0] **Factory OOLD:** Controls the HY-5A OOLD detector, see page 45.

**Installer 33** [SLd]. **Factory SLD:** Controls the HY-5A Shadow detector, see page 45.

## Correctional Facility – User Optional Wiring

A special terminal strip has been pre-wired to the three user relay outputs in Correctional Facility (CF) models for easy field wiring of the common interconnect options. If alternate output functions are required, see page 31, Options for User Programmable Output Relays 1-3. NOTE: User 3 Relay on Smart Touch boards is rated for DC only up to 48V and does not have an N.C. (normally closed) connection.

### Connecting an Interlocked Pair:

An interlocked pair of operators is not a Master/Slave system. It is two gate operators interlocked such that the one cannot open unless the other is fully closed. This connection is used frequently at correctional facilities for Sally Port gates. The Smart Touch Controller provides both the required interlock input (#7) and the interlock output contact.

1. User relay 3 on the Smart Touch Board has been set by the factory to provide the necessary interlock function. Connect a total of four wires between operator #1 and operator #2 as follows: One wire to the Common buss of each operator to the User 3 relay COM terminal of the other operator. Then, connect wires from the User 3 relay NO terminal to the Interlock input (#7) of the other operator.
2. If User relay 3 has already been used for a different function, then one of the other relays User 1 or User 2 must be wired as described above and set to output function 1. The user relays are configured in the Installer Menu as item [r1\_\_], [r2\_\_] or [r3\_\_] according to the definitions described on page 31.
3. The interlock input, terminal #7, is convertible to alternately be a time clock input, so it is possible that it may need to be switched back for the interlock function. If this alteration is needed, go to the Installer Menu, and set item [tC \_\_] to be [tC\_1].

### Connecting to an External Lock Mechanism:

The Smart Touch Controller can command an external solenoid lock or maglock to unlock just before gate motion begins.

1. User relay 2 has been set by the factory to provide the necessary output for a solenoid lock. Connect the voltage matching the lock solenoid to User 2 COM and connect a solenoid coil to User 2 NO (connect a maglock coil to User 2 NC). The un-switched solenoid or maglock wire connects directly to its supply voltage common conductor.
2. If User relay 2 has already been used for a different function, then one of the other relays User 1 or User 3 must be wired as described above and set to output function 6. The user relays are configured in the Installer Menu as item [r1\_\_], [r2\_\_] or [r3\_\_] according to the definitions described on page 31.

### Connecting the Gate Secure Position Indicator Output:

The Smart Touch controller can signal an external device that the gate is secure.

1. User relay 1 has been set by the factory to provide the necessary output for position indication. Connect the voltage matching the indicator light to User 1 COM and connect the gate secure light to User 1 NC. The other indicator light wire connects directly to the voltage common conductor. If an unsecured light is required, connect it to User 1 NO.
2. If User relay 1 has already been used for a different function, then one of the other relays, User 2 or User 3, must be wired as described above and set to output function 1. The user relays are configured in the Installer Menu as item [r1\_\_], [r2\_\_] or [r3\_\_] according to the definitions described on page 31.

## Options for User Programmable Output Relays 1-3

The Smart Touch Controller can be set to interface to many types of external devices through the use of its programmable output relays. All of the output functions listed below are accessible in the Installer Menu under the selection [r1 \_\_], [r2 \_\_] and [r3 \_\_]. Select which relay you wish to use and enter the appropriate function by the numbers as listed below. **Note:** The User Relays will operate normally to less than 18VDC.

1. **Close limit output:** This output can be used to create an interlock signal to another operator's interlock input, or simply to indicate that the gate is secure. The relay is **released** at full closure.
2. **Close limit pulse output:** This output may be used in a sequenced system to command a 2<sup>nd</sup> machine to close. Generates a brief pulsed output that occurs when the close limit is triggered.
3. **Open limit output:** This output is used to indicate a full open position indication. This output becomes active when open limit is triggered and releases when the open limit is released.
4. **Open limit pulse output:** This output may be used to trip a sequenced barrier arm gate operator to open. Generates a brief pulsed output when the open limit is triggered. An additional pulse is also generated with any new open command even when the gate is already fully open.
5. **Warn before/during operate output:** This output may be used to control an external warning device. This output will operate at the same time as the internal warn before operate buzzer.
6. **Gate Lock output:** This output may be used to control external solenoid locks or magnetic locks. In both directions of travel, this output will be activated about 7/10<sup>th</sup> of a second before the operator starts moving the gate, and remains active while moving and for a few seconds after stopping.
7. **Gate forced open output:** Activated if the gate is forced off the closed limit switch, and operator is not able to restore the gate to full closed within four seconds. This alarm resets itself in 30 seconds.
8. **Gate open too long output:** Activates when the gate has been open longer than a user-selected period of time. Adjustable from 0 delay, then 15 seconds delay to 135 seconds delay in 15-second time increments.
9. **Safety Mode Alert output:** Activated when system is in the Safety Mode or the Entrapment Mode. Safety Mode occurs upon an impact with an obstruction. Entrapment Mode means the gate is stopped and occurs if the internal inherent sensor triggers while the system is in the Safety Mode.
10. **Entrapment Mode Alert output:** Activated only when system is in the Entrapment Mode.
11. **Unauthorized Vehicle Entry output:** Activated when a 2<sup>nd</sup> vehicle enters from the outside, without a valid input from an access control device. This output releases when an access control input signals open or the gate reaches the close limit position.
12. **Outside Obstruction Vehicle Detector output:** This output may be used to interlock to an entry device to prevent pedestrian use. This output is active whenever the OOLD is tripped.
13. **Special output from "OOLD" only when gate is closed:** Used to annunciate a vehicle or to indicate loitering. Adjustable from 0 delay, then 15 to 135 seconds delay in 15-second time intervals.
14. **Gate nearing full travel output:** For operators with RPM sensors only. This output is activated when the gate is three feet from full travel in both the open and close directions. This output can be used to reduce the sensitivity of a proximity sensor near the ends of gate travel.
15. **Gate Failure output:** This output is activated to report that a problem has occurred. Indicates that system in an Error Mode, Fault Mode or Entrapment Mode. If active, the gate is disabled.
16. **Motor Running output:** This output is active when the motor is running and the gate is in motion.
17. **AC Power Failure output:** This relay is normally energized, but drops with loss of AC power. This output is also active on DC machines when the battery charger is off.
18. **DC Power Failure output:** This output is activated when the battery power is very low, but the output ceases when the battery is dead. The relay is triggered when the battery is less than 20 Volts.

19. **Flasher Relay:** This output is intended to control flashing lights that pulse once per second. This relay is flashing all the time, except when the open limit switch is tripped.
20. **Free Exit Loop Vehicle Detector output (available with h3.23 and higher software):** This output is active whenever the ELD is tripped.
21. **Inside Obstruction Vehicle Detector output (available in h3.23 and higher software):** This output may be used to interlock to an exit device to prevent pedestrian use. This output is active whenever the IOLD is tripped.
22. **N/A (Not used in TYM-HYD)**
23. **Gate Lock Output (available in h3.26 and higher software):** External gate lock output. Activates at initiation of open cycle and remains on for 10 seconds. Similar to #6 but shuts off after 10 seconds.
24. **Gate at Partial Open Position (available in h3.26 and higher software):** This output is active when the partial open position is reached or exceeded.

## Clock Functions

### Setting the Time and Date

The Smart Touch Controller is equipped with a 24 hour (military time), 365 day clock, so that significant events can be logged and stamped with the time and date. This troubleshooting feature is useful to record key historical operational data and a log of Alerts, Faults and Errors. The log can be accessed via the RS232 port. Optional software and a serial communication cable are required in order to read this log. Contact Tymetal to purchase software and download cable\*.

1. To set or adjust the time, go the User menu item [CL\_0] and push the **Select button**, so that [CL\_0] blinks. Using the **Previous** and/or **Next** buttons, change the setting from [CL\_0] to 1, 2, 3 or 4 depending upon which setting is to be changed. 1 = minutes / 2 = hours / 3 = days / 4 = months.
2. Push the **Select button**. The display will change to a blinking (adjustable) value. Different displays will appear (see table below) based on which [CL] value is selected:

Setting	Value	Display
[CL 1]	minutes	[ni 0-59]
[CL 2]	hours	[hr 0-23]
[CL 3]	days	[dA 1-31]
[CL 4]	months	[no 1-12]
[CL 0]	Run Mode	None

3. Change the hour, minute, day or month to the desired value using the **Previous** and/or **Next buttons**, then press the **Select button** to enter the change. [CL 0] will appear.
4. To change another setting, Press the **Select button**, (display will blink), then move to that setting using the **Previous** and /or **Next** buttons and repeat steps 2 and 3 until the clock is fully set.
5. When finished, be sure [CL 0] is displayed, then push **MENU** to exit.
6. A lithium disk battery supports the clock so that the time is not lost when the main power is off. This battery should be replaced about every five years. Use a DL 2025 / DL 2032 or CR 2025 / 2032 battery.

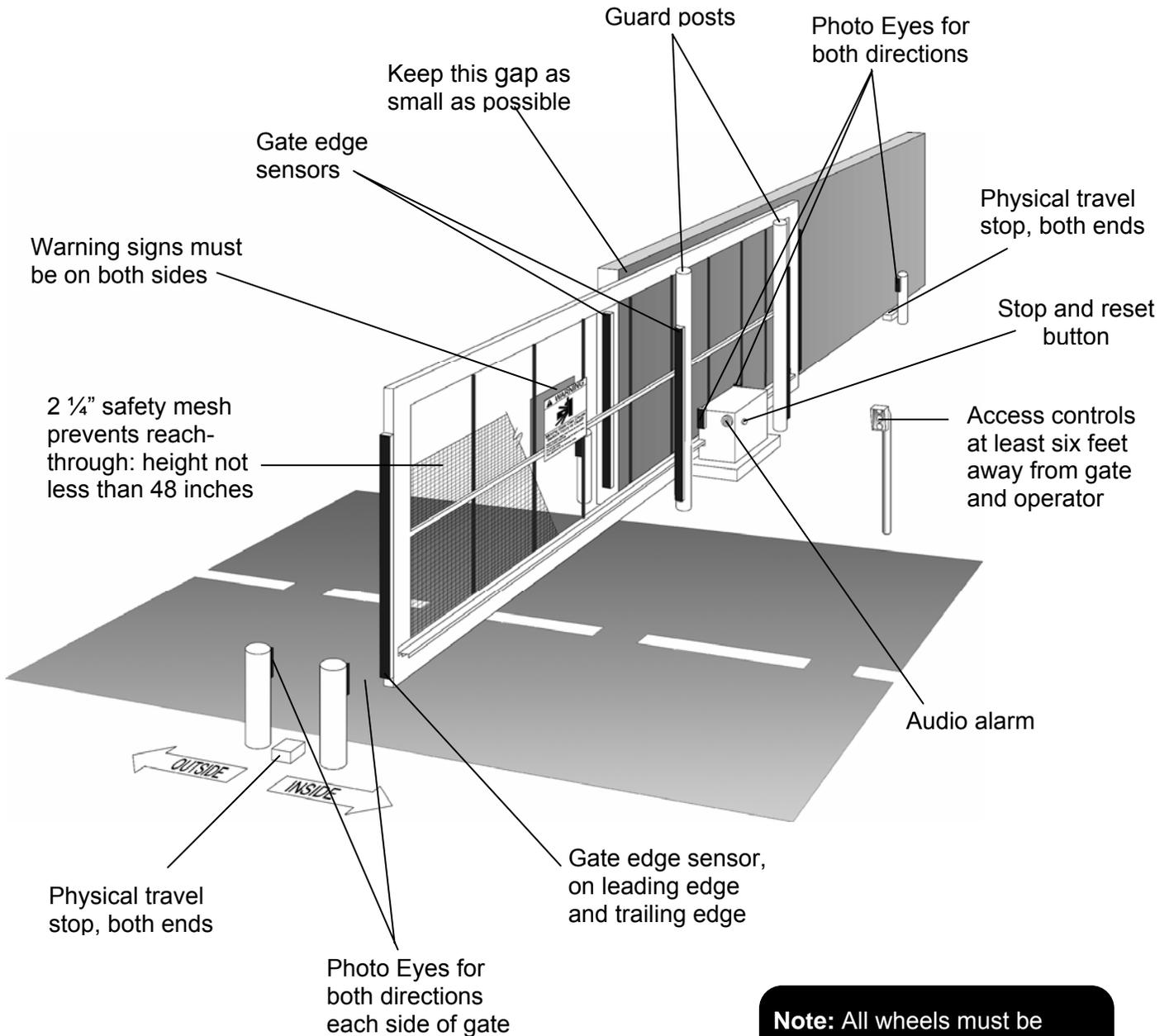
\* **START** Configuration and Diagnostic software is available at no charge from the HySecurity website - [www.hysecurity.com](http://www.hysecurity.com). A serial communication cable and USB adaptor (Part #26032) can be ordered through Tymetal.

**Entrapment Protection Devices for Sliding Gates**



Attention

**Entrapment Protection Device Schematic for Sliding Gates**



**Note:** All wheels must be covered. (Wheels and covers not shown for clarity)

This schematic view is not meant to recommend a specific configuration. It is not meant to point out the important elements of a proper automatic vehicular gate installation. The gate operator is only one component in the total system. **Always install a separate pedestrian gate.**

## UL 325 Standard requirements for Entrapment Protection Devices

### Gate Operator Category

Usage class	Horizontal Slide, Vertical Lift, Vertical Pivot		Swing and Vertical Barrier (arm)	
	Primary type <sup>a</sup>	Secondary type <sup>a</sup>	Primary type <sup>a</sup>	Secondary type <sup>a</sup>
Vehicular I and II	A	1, B2, or D	A, or C	A, B1, B2, C, or D
Vehicular III	A, B1, or B2	A, B1, B2, D, or E	A, B1, or C	A, B1, B2, C, D, or E
Vehicular IV	A, B1, B2, or D	A, B1, B2, D, or E	A, B1, C, or D	A, B1, B2, C, D, or E

Note—The same type of device shall not be utilized for both the primary and the secondary entrapment protection means. Use of a single device to cover both the opening and closing directions is in accordance with the requirement; however, a single device is not required to cover both directions. A combination of one Type B1 for one direction and one Type B2 for the other direction is the equivalent of one device for the purpose of complying with the requirements of either the primary or secondary entrapment protection means.

### <sup>a</sup>Entrapment protection sensor types:

Type A - Inherent entrapment sensing systems.

Type B1 - A non-contact sensor (photoelectric sensor or the equivalent).

Type B2 - A contact sensor (edge sensor device or the equivalent).

Type C - Inherent adjustable clutch or pressure relief device.

Type D - An actuating device requiring continuous pressure to maintain opening or closing motion of the gate.

Type E - An inherent audio alarm, which warns a minimum of 3 seconds before operation.

### UL Usage Class Information:

The automatic vehicular operator must also be labeled as appropriate for both the type and usage class of the gate. Installers must verify that the gate operator is labeled for the intended application. Note: Sliding gate operators installed in Class I & II applications must not move the gate faster than 12 inches per second.

**Class I:** Intended for use in a location with one to four single family dwellings, or a parking area associated therewith.

**Class II:** Intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units) hotel, garages, retail store or other building servicing the general public.

**Class III:** Intended for use in an industrial location or building such as a factory or loading dock or other locations not intended to service the general public.

**Class IV:** 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.

## Placement and Use of Secondary Pedestrian Entrapment Sensors

**WARNING: To reduce the risk of serious injury or death, read and follow all instructions in the gate operator handbook and on the warning labels.**

Automatic gate operators are intended only for vehicular use and pedestrians must be routed to a separate man gate, however sensors are still required in order to provide a degree of protection should anyone happen to stray into the area of an automatic gate. Generally there are two types of external sensors that may be used: Contact type sensors, such as an edge sensor, and non-contact sensors, such as photoelectric eyes. Current industry standards require the use of either type, or both, of these sensors as a secondary device. In Class I and Class II automatic sliding gate installations because the general public is likely to be present. Although there are alternatives for Class III and IV installations, we highly recommend the use of external sensors for all automatic gate applications.

The specifier or installer may choose either photoelectric eyes or edge sensors, or use these devices in combination, but both the open and closing directions of gate travel must be guarded. The UL 325 standard for automatic sliding gates specifically requires the following:

- One or more non-contact sensors (photoelectric eyes) shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate.
- One or more contact sensors (edge sensors) shall be located at the leading edge, trailing edge and post mounted both inside and outside of a sliding gate.
- A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate is not subjected to mechanical damage.
- A contact sensor that transmits its signal to the gate operator shall be located such that the signal is not impeded by building structures or other obstructions and shall function under its intended end-use conditions.
- The contact and non-contact sensors must be tested and labeled as “Recognized Components” under the UL 325 standard in order to be deemed acceptable for use in this application.

**Study the entrapment protection schematic and consider your specific installation to determine where the greatest risks of entrapment exist. Locate edge sensors and/or the photoelectric sensors accordingly. Be certain that a sufficient number of sensors are used so that both directions of gate travel are properly guarded.**

## Installing Gate Edge (Contact Type) Reversing Sensor

1. Follow the guidelines in the Entrapment Protection Schematic to plan the most appropriate mounting positions for the edge sensors to be installed. For sliding gates, one or more sensors shall be located at the leading edge, trailing edge and post mounted both inside and outside of a sliding gate. A requirement of the UL 325 standard is that an edge sensor be laboratory tested and “recognized” under UL 325.
2. Drill holes through the edge’s mounting channel and through the surface that each gate edge is to be mounted. Securely fasten every edge sensor. The edge sensors should all be placed not higher than 6” above the ground.
3. Edge sensors that are not attached to the moving gate, such as post mounted sensors are wired in parallel and directly connected to the gate operator:
  - a. Mount a gate edge to the wall, pilaster or end post of the fence that aligns with the gate when it is in the open position.
  - b. Always route the leads of the edge sensors to the gate operator so that they are protected from physical damage.
  - c. Connect one edge sensor lead to our Common Buss on the power supply board and the other to terminal #13, which is labeled **Edge Sensor** input.
4. Edge sensors mounted to the leading edge or trailing edge of the gate panel should be used with an edge transmitter and a receiver in order to transmit to the gate operator. We do not recommend the use of retractable cord reels or curl cords because of durability problems with these devices in outdoor environments.
  - a. Mount gate edge sensors to the leading edge and trailing edge of the gate so that entrapment protection is provided in both directions of travel.
  - b. Mount one or two edge transmitters (Linear Model #3022 or equivalent) onto the gate panel near the upper corner of the leading edge of the gate. Both gate edges will function correctly if only one transmitter is used, but wiring both edges to a single transmitter may be impractical or displeasing visually.
  - c. Connect the edge(s) to the terminals in the edge transmitter and set the “DIP” switches of the transmitter to match the setting in the receiver to be used.
5. Mount a commercial style radio receiver\* (external antenna type) on the inside of the operator, below the electrical box. Knock out the smallest hole in the lower right corner of the electrical box and route the wires to the area marked Radio Options. Only three wire connections are needed because the 24-Volt supply and the radio output share a wire. Being certain to observe polarity, crimp the black radio power wire together with one of the radio output wires into a .25” spade connector and connect to the COM terminal. Connect the red wire to the +24V terminal and connect the other radio output contact wire to the spade marked EDGE. Note that this terminal is the same as the #13 input terminal labeled Edge Sensor on the main control board.
  - a. Mount an external antenna onto the top of a fixed post of the fence near the operator.
  - b. Connect the antenna into the socket on the radio receiver.
  - c. Set the “DIP” switches in the receiver to match the same code used in the transmitter.
6. Test the operation of the reversing edge to make sure that it functions correctly. Advise the user of the gate to be certain to retest this vital function weekly.

\* If there is also to be a radio receiver for a hand held transmitter to operate the gate, be certain to use a two channel commercial receiver. The edge and hand held transmitters must have their codes set the same or they will not function.

## Installing Photoelectric (Non-contact) Sensors

### General Information:

Follow the guidelines in the Entrapment Protection Schematic to plan the most appropriate mounting positions for the photo-eye sensors to be installed. If there are no other secondary external entrapment protection sensors (typically an edge sensor), at least two photoelectric sensors are required to serve to reverse the gate in each direction of travel. The Smart Touch Controller has two photoelectric sensor inputs (Photo eye open and Photo eye close).

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

### Compatibility:

A requirement of the UL 325 standard is that a photoelectric sensor be laboratory tested and “recognized” under UL 325. In order to be compatible with a TYM-HYD operator, a photo eye must be rated to function from 24 Volts DC source power.

### Installation:

Mount the photo eyes approximately 15” to 30” above the ground and as close to the gate as possible. Unless there are also gate edges for entrapment protection, a minimum of two photo eyes will be required to function for both the open and closing directions of travel. Mount the receivers on the left and right sides of the gate operator and the emitters just beyond the travel of the gate in both the full open and full closed positions of travel. In some situations, an additional photo eye should be installed on the public side of the gate. **The installation locations described above are intended for pedestrian detection.** If photo eyes are also to be used for vehicular detection, consider, in addition to the low elevation photo eye for cars, installing another photo eye at a height of about 55” to detect semi-trucks.

### Configuration:

If the photo eye has an internal switch for setting Light Operate vs. Dark Operate, select Light Operate. If the photo eye has a relay output and has both NO and NC terminals, some experimentation may be required to determine the proper connection. This is because, in the Light Operate mode, the output relay is normally energized and releases when the beam is blocked. Some manufacturers label an output as NO, when it is actually an NC contact. If the photo eye has a solid-state output you must choose a sinking type connection.

### Connection:

Three wires to the receiver and two wires to the emitter are all that is required.

- a. The +24 Volt source power is obtained at one of the three spade terminals on the power supply board.
- b. The –24 Volt source power is obtained from spade terminals on our terminals #14 or #15, labeled (Photo Eye Power) on the Smart Touch Controller board.  
Note: The –24 Volt Photo Eye Power also supplies the photo eye output Common.
- c. The photo eye NO or NC output connects to the Smart Touch Controller board at terminal #19 if the photo eye spans the road, or at terminal #17 if the photo eye spans the gate’s open storage area.

## Installing Photoelectric (non-contact) Sensors – continued

### Supervised Connection

If the photo eye being installed has a true NC output (one that is NC when the photo eye is powered, aligned and set for Light Operate), then a supervised connection is recommended. A supervised connection will signal a system Fault and prevent gate operation if either the open or close photo eye connection ever becomes an open circuit or a short circuit. The Installer Menu item [PC\_0] must be changed to [PC\_1] to enable this feature. See Installer 18 on page 29.

### Photo Eye Function

**A tripped photo eye will prevent the gate from starting in either direction if the gate is stationary.** If tripped while in motion, the standard function is to pause the gate motion and then automatically restart again if the photo eye is clear within five seconds. An optional setting in the Installer Menu will cause a 2 second reversal of travel. See Installer 14 & 15 starting on page 28.

### Alignment

Most photo eyes require careful optical alignment in order to aim the emitter beam to the center of the receiver or reflector. In order to avoid false triggering, it is important to carefully align the system, especially with retro-reflective photo eyes. The best way to assure true centering of the beam is with some trial testing where the emitter is shifted to move the beam left and right and up and down until the range of the invisible cone of the infrared beam is known. Photo eyes usually provide alignment aid LED's for this setup, but they can be hard to see. Tymetal and HySecurity have provided a unique feature that turns power on to the photo eyes and causes our buzzer to chirp when the photo eye enters and exits alignment. See User Menu item 9 on page 27 to enable this feature. Set the menu item [PE\_0] to [PE\_1] and the buzzer will chirp twice when the beam is broken and once when remade. (The parameter will automatically reset the next time the Close Limit Switch is triggered.)

### Notes about Retro-Reflective Systems

Correct installation and alignment of a retro-reflective photo eye and its reflector is important for a trouble free installation. Any system operating at a range greater than 16 feet is more prone to false triggering due to dirty optics, condensation or poor weather. If care is taken in the initial mounting and alignment of the 3-inch reflector, the chance of problems is greatly reduced.

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

The ideal mounting for the reflector is suspended inside a twelve inch long piece of 3-inch PVC conduit. Cut the opening of the PVC conduit at a 45-degree angle to act as a drip shield. Hold the reflector against the backside of the PVC conduit by attaching a 3-inch male connector. Do not cement the connector. This would prevent the reflector from being reached for future cleaning. To create a mounting base, attach a 3-inch aluminum flange (electric meter hub) to the connector. This whole package can be mounted to any flat surface.

Locate the reflector in the center of the invisible beam of infrared light to achieve the most sensitive alignment. The beam center is determined by the following test: while holding the reflector in your hand, slowly raise it until the beam is no longer returned, and the photo eye trips. Mark this maximum height. Now lower your hand and determine the lower limit of the infrared beam by watching for the trip point. Mark this position as well. Repeat the same procedure for left and right at the center elevation of the beam, as determined by the previous test. Once the four limits have been determined, either mount the reflector in the center of the area outlined or realign the eye for the position of the reflector. If the photo eye is realigned, be sure to perform the centering test again to verify that the reflector is truly in the center.

## Detector Loop Installation

### Detector Basics

The vehicle detector passes a small current flow through the “loop” which then becomes an inductive coil.

When a vehicle passes over a loop the detector senses the resultant drop in the inductance, and actuates the detector output.

### Loop Configurations

Configurations differ depending on the application. In parking applications with HySecurity’s StrongArm operator (HTG 320), a loop may be as small as 4’ x 6’. In traffic applications employing one of our sliding gate operators, or swing gate operators, the smallest loop should not be less than six feet square.

### Rules to Follow for Security Gate Applications

1. The side of the loop closest to the gate shall be located at least four (4) feet distant from it’s line of travel.
2. The shortest side of the loop shall be between six (6) and eight (8) feet in length. The longest side of the loop shall be between six (6) and twenty (20) feet in length. For applications that need to span a wide area, use several smaller loops. Do not exceed a maximum of 200 square feet of loop area to only one detector.
3. In applications with multiple loops, keep each loop at least six feet apart. This avoids “cross talk”. It is possible to have loops closer together by selecting different frequencies. An advantage of using HySecurity model HY-5A detectors is that problematic “cross talk” is not possible.
4. For greater sensitivity and less chance of false calls caused by the motion of the gate, it is better to use multiple smaller loops, connected in a series circuit, to one detector instead of one large, single loop.
5. To avoid interference, keep loops at least two (2) inches above any reinforcing steel. Do not route loop wires with, or in close proximity to, any other conductors, including other loop leads, unless shielded lead-in cable is used. Never route high voltage circuits in PVC conduit near a loop.
6. Loop and lead-in wire should be one continuous piece. Avoid splices, if possible. If a splice is necessary for any reason, “pot” the splice in epoxy or use heat shrink to ensure that the quality of the splice covering is the same as the original wire jacket.
7. Use only number 14, 16, or 18 gauge stranded wire with a direct burial jacket. Cross linked polyethylene insulation types, such as, XLPE or XHHW, will last much longer and are less prone to damage during installation than conventional insulation types. Preformed loops can be used before road surfacing or under pavers.
8. Twist loose tails of lead-in wires tightly, approximately ten times per foot.

Twist lead-in at least 10 turns per foot



Like This



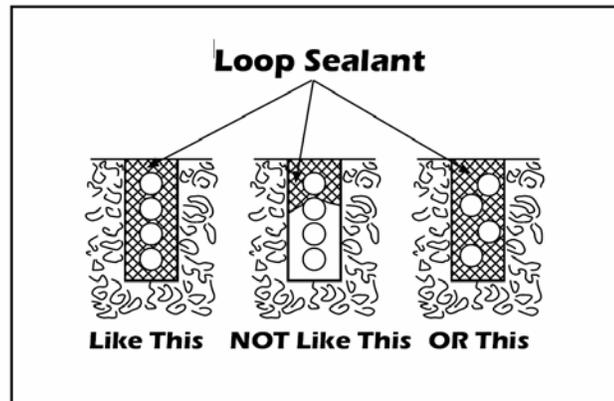
Not Like This



E31a

## Detector Loop Installation continued

9. Follow this guide for the correct number of turns in the loop;  
**12 to 20 sq. ft = 5 turns 20 to 60 sq. ft. = 4 turns 60 to 240 sq. ft. = 3 turns**
10. This guide is written from a design perspective, but installation workmanship practices are equally important to insure proper operation and long loop life. The best way to insure a quality installation is to employ a professional installer experienced with detector loops. A few important practices are:
- The slot in the surface should be cut  $\frac{1}{4}$ " wide x  $1\frac{1}{2}$ " deep.
  - The corners of the cut must be at an angle or core drilled to relieve stress on the wires.
  - After the wire is installed, the slot must be completely backfilled with a non-hardening sealer. Note that if the loop wires are able to move in the slot after the sealer has set, the detector may give false calls.



### Detector Logic

Tymetal and HySecurity recommend that vehicle detectors be used for free open and obstruction sensing logic only. The exception is in parking applications with HySecurity's StrongArm operator (HTG 320) where detectors may be also used to close the gate. In applications employing our swing, vertical lift, or sliding gate operators, closing logic cannot be used. Because of their slower speeds, closing logic is a poor choice for security gate systems. Since there are several ways that the gate may be left standing open and because there is a loss of safety, our circuit has not been designed to accommodate "detect to close" logic.

### Loop Diagnostics

The following tests cannot guarantee a functioning loop, but failure of either test means that the loop is definitely suspect, even though it may still be functioning at the time.

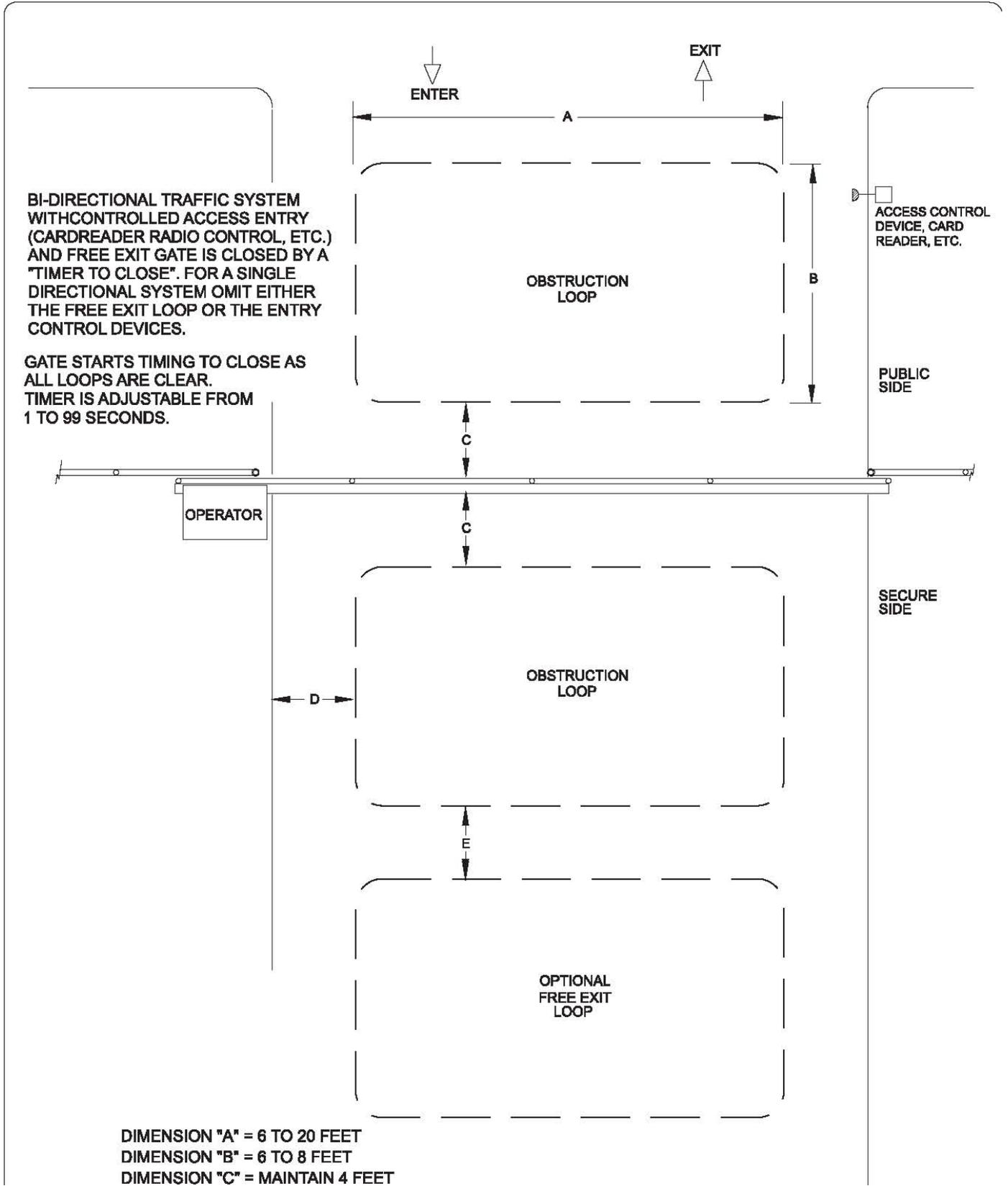
#### Test #1:

Resistance of the loop and lead-in wire should not exceed 4.0 Ohms.

#### Test #2:

The resistance to earth, as measured with a 500V "Megger", should be 100 Megohms or more. Loops may function at 10 Megohms or less but will not be reliable (e.g. when the ground is wet from rainfall). Low resistance indicates broken or moisture saturated insulation. This is common if inappropriate wire insulation has been used.

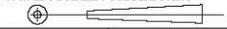
See also Detector and Loop Fault Diagnostics on page 45 for additional tests that may be performed with HySecurity HY-5A detector modules.



BI-DIRECTIONAL TRAFFIC SYSTEM WITH CONTROLLED ACCESS ENTRY (CARD READER RADIO CONTROL, ETC.) AND FREE EXIT GATE IS CLOSED BY A "TIMER TO CLOSE". FOR A SINGLE DIRECTIONAL SYSTEM OMIT EITHER THE FREE EXIT LOOP OR THE ENTRY CONTROL DEVICES.

GATE STARTS TIMING TO CLOSE AS ALL LOOPS ARE CLEAR. TIMER IS ADJUSTABLE FROM 1 TO 99 SECONDS.

DIMENSION "A" = 6 TO 20 FEET  
 DIMENSION "B" = 6 TO 8 FEET  
 DIMENSION "C" = MAINTAIN 4 FEET

	TITLE	DRAWN	DATE	THIRD ANGLE PROJECTION	REV
	SLIDE GATE LOOP LAYOUT	DB	05/15/00		A
		CHECKED	DATE	ERN NUMBER	
		APPROVED	DATE	DRAWING NUMBER	
				E96	1 OF 1

## Vehicle Detector Installation Options

The Smart Touch Controller provides a feature rich interface to four different vehicle detector inputs. Standard box type 11 pin (24 Volt DC or 24 Volt AC) vehicle detectors may be connected in the traditional manner, see page 44. HySecurity also offers a custom mini detector module that plugs directly into the Smart Touch control board. Not only is the field installation much faster, but there is a large performance benefit. The HySecurity HY-5A detector is controlled by the Smart Touch microprocessor to achieve many benefits over common box type detectors:

- Loop frequency is automatically set and monitored by the Smart Touch Controller
- Cross talk between multiple loops is impossible
- The best operating frequency for each loop is automatically chosen
- Smart Touch can report the both loop frequency and call strength on its LCD display
- Smart Touch will report loop malfunctions and store this data in its memory.
- Most detector or loop faults that could occur are reported and displayed on the LCD display

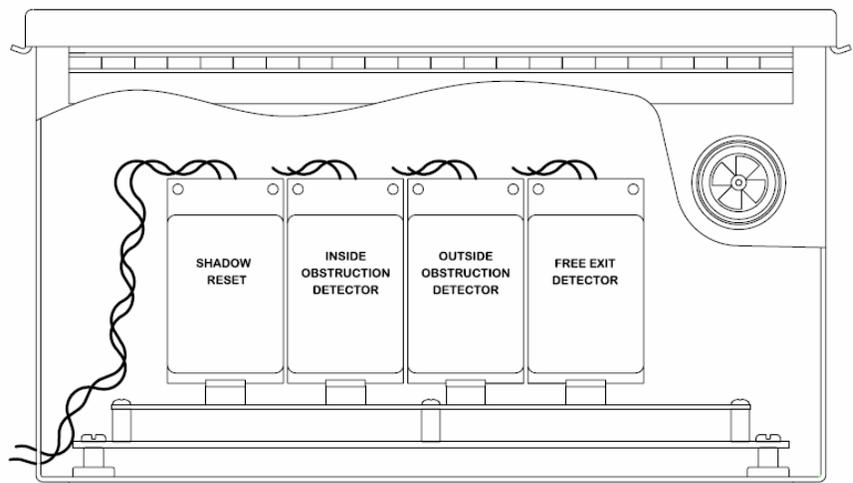
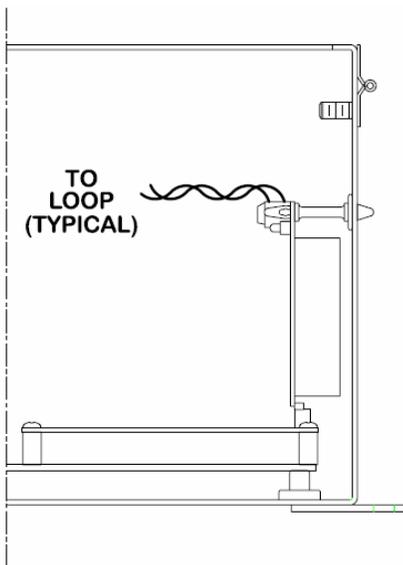


There are four vehicle detector inputs available both on the main terminal strip and as direct plug in modules. The vehicle detector inputs are for the following functions:

- Free Exit Loop Detector – “**ELD**” for short
- Outside Obstruction Loop Detector – “**OOLD**” for short (this is the outside reversing loop)
- Inside Obstruction Loop Detector – “**IOLD**” for short (this is the inside reversing loop)
- Shadow Loop Detector – “**SLD**” for short (this is for swing gates only)

A combination of HY-5A detectors and box detectors is acceptable

**It is not mandatory to use two separate detectors for inner and outer obstruction detection,** however the benefits of using this additional detector are great. Several new features are possible, such as 2<sup>nd</sup> vehicle tailgating detection, loitering alert, several anti-tailgating options and selectable non-reversing. Multiple obstruction detectors may be mandatory because not more than 200 sq-ft of loop area may be connected to any one detector or the sensitivity becomes inadequate.



## HySecurity HY-5A Vehicle Detector Installation

1. Insert the locking end of each of two white plastic standoffs into the mounting holes on the detector.
2. Plug the detector into the appropriate socket along the right edge of the Smart Touch Controller board for the detector function that is desired. Be careful to align the six detector pins into the socket correctly, and then snap the standoffs into the holes on the right side of our control enclosure.
3. Route the loop wires through the wire guide provided and connect the loop leads to the two terminals directly on the detector. Tighten the terminal screws securely.
4. When the power is turned on, the detectors will immediately tune themselves.
5. Once enabled, if the detector module is unplugged, a communications alert [AL10] will be triggered, then if the fault continues, [ERR3] “detector failed” is displayed. The operator will also run as if the detector is triggered. The [ERR3] can only be cleared by pressing the Reset button, which electronically uninstalls the detector. See Detector & Loop Fault Diagnostics on page 45.
6. The Smart Touch Controller automatically governs frequency selection of all HY-5A detector modules. This simplifies installation and guarantees that there is no cross talk between multiple loops. The frequency can also be manually selected if needed, see the installer menu options.
7. Sensitivity is the only adjustment on the detector itself. Generally, sensitivity does not need to be increased unless the loop is large loop or there are multiple loops connected to one detector. Do not exceed more than 200 sq/ft of loop area to one detector.

The rotary switch for sensitivity has eight settings, which are as follows:  
 0 = Low, 1 = Normal, 2 = Medium, 3 = High (4-7 add the boost feature\*)  
 4 = Low, 5 = Normal, 6 = Medium, 7 = High

\*Boost increases the sensitivity during a call and is useful for maintaining continuous detection when the signal may become weak, such as semi-trucks.

8. Vehicle detector functions are configurable in the Installer Menu as shown below.

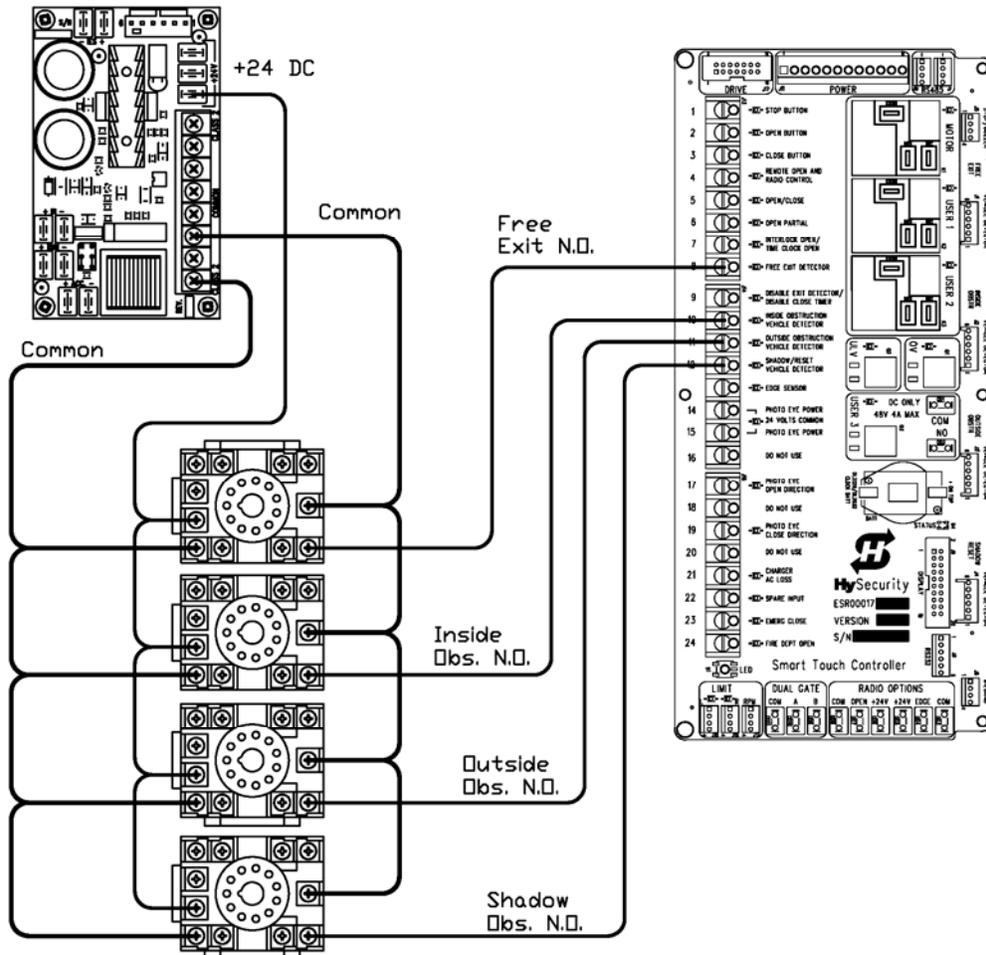
I21	[or 1] OOLD detector function	1	0 = pause only, 1 = enable reversing to open
I22	[ir 1] IOLD detector function	1	0 = pause only, 1 = enable reversing to open
I23	[dL 1] Vehicle detector logic	1	1 – 4, 1 = std, 2&3 = quick close, 4 = full anti-tailgate*

The outside and inside Obstruction Loop Detectors “OOLD” or “IOLD” are factory configured to fully re-open the gate as a default setting. In the Installer menu, each detector can individually be set so that when the gate is closing there is only a pause if triggered. To change the IOLD setting, go to the menu item [ir\_\_] and set to 0. For the OOLD, go to the menu item [or\_\_] and set to 0.

\* See page 46 for optional Vehicle Detector logic modes and anti-tailgate option.

## Standard 11 Pin Box Type Vehicle Detector Installation

1. If standard 11 pin vehicle detectors are to be used, install the sockets into the control box (if there is room) or in a separate external housing. The diagram below is for connection reference only. Other items may already be installed in the physical area where the sockets are shown.
2. Both 24 Volts AC or DC are available, so either detector voltage may be used (24 VAC is not available if the operator is a battery type). 24 VAC is available at the spade terminals on the lower left corner of our power supply (marked ACC). 24 VDC is available from the Common Buss and the +24 V spade terminals next to the Common Buss.
3. Connect 24 Volt power to the detector. Polarity does not matter if the detector is a 24 AC model. If a DC detector is used, pin #1 is (+) on a DC detector and pin #2 is (-).
4. Connect the output pin #6 to the Common Buss on the power supply and the output pin #5 to one of the four detector inputs (depending upon the detector function required) on the Smart Touch Controller terminal strip.
5. If multiple detectors are used, run the power wires and common wire from socket to socket rather than running each to the same location separately. The only wires that are separate are the output wire to the Smart Touch Controller and the loop input wires.
6. Always keep the loop wires well twisted at all places beyond the area of the loop. The lead in portion sealed in a saw cut does not need to be twisted so long as the wires are encapsulated in loop sealant and cannot move.



## Detector & Loop Fault Diagnostics

If HySecurity HY-5A mini detector modules are used, the Smart Touch Controller has ability to store and report detector and loop fault information for performance diagnostics. If The Smart Touch Controller senses a loop or detector problem, the LCD display will flash the abbreviation for the affected detector (ELd – ioLd – ooLd – SLd) then it will flash the appropriate Alert Code (ALE\_) to disclose the nature of the problem and the buzzer will chirp.

Loop detector freq change alert	ALE7	2 chirps/sec every 15 seconds
Loop shorted or open alert	ALE8	2 chirps/sec every 15 seconds
Loop detector failed alert	ALE9	2 chirps/sec every 15 seconds
Loop detector active >5 minutes	AL12	2 chirps/sec every 15 seconds
Loop detector comm. alert	AL10	2 chirps/sec every 15 seconds
Loop detector function alert	AL11	2 chirps/sec every 15 seconds
Loop detector failed	Err3	3 chirps/sec once per minute

Even if the loop problem self heals, historical data about detector/loop performance and a log of Alerts, Faults and Errors can be retrieved from the Smart Touch Controller by downloading from the RS232 communications port. Optional HySecurity “START” software, a PC computer, and a special download cable are required to retrieve and read this data (see bottom of page 32).

### Frequency:

Knowing the exact frequency of a loop can be useful as a diagnostic tool, and verifying that the loop frequency is stable is also very valuable information. To view the actual loop frequency of a specific vehicle detector, go to the setting for that detector, then switch the selection to 1 and press the menu button. The display will flash between [F\_xx] which are the high digits, then the low digits of the loop frequency counter. For example: [F\_05] + [3413] would represent a frequency of 53,413 Hertz. The highest digit will probably be only a single digit because loop frequency is usually a five-digit number, between 20,000 to 80,000 Hertz.

### Changing the Loop Frequency:

HY-5A detectors can never crosstalk. If for any reason, you want to manually change the loop frequency, change the menu selection to a flashing 4 and then press the Select button. Each detector has a choice of four frequencies. To exit, press the Menu button and the controller will perform a reset and tune to the new frequency setting.

### Call Strength Level:

Knowing the strength level of a detector call is valuable because it provides information about how well the loop is actually “seeing” a specific vehicle. For example, it may be useful to check to see if the loop is easily detecting the middle of a high bed semi-truck. The strength of a detector call can be displayed in real time, on a scale of 1-7. As indicated in the table below, when a detector’s menu setting is set to 2, and the menu button is pressed, the LCD display will read [LE\_x]. If the call strength is level 4 or less, consider increasing the sensitivity level, by adjusting the rotary switch on the HY-5A detector.

Installer Menu Options			Default	Description
I30	[ELd0]	Test factory ELD	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I31	[iLd0]	Test factory IOLD	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I32	[oLd0]	Test factory OOLD	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7
I33	[SLd0]	Test factory SLd	0	0 = Run mode, 1 = show freq, 2 = show call level 0-7

**Acronyms:** Free Exit Loop=**ELd**, Outside Obstruction Loop=**ooLd**, Inside Obstruction Loop=**IoLd**, Shadow Loop Detector=**SLd**

**To return to the Installer Menu, press “Program Menu”. Set the selection back to 0 by pressing “Next”, then press “Program Menu” twice to return to Run Mode.**

## Vehicle Detector Configuration & Anti-Tailgate Modes

**Standard and Anti-tailgate modes are selectable under item [dL\_\_] in the Installer Menu**

(See installer menu #23 described on pages 28 and 29.)

The detector function modes that result in Anti-Tailgating logic (modes 3 & 4 below) require the use of a separate inner and outer obstruction detectors.

In order to use any vehicle detector logic mode other than mode 1, all the loops must be placed with the geometry and spacing as shown in the loop layout drawings in Appendix

**Mode 1: (Default)** An input from either the Free Exit, OOLD, IOLD or the Shadow detector will hold the gate open, reset the close timer, and block all close inputs.

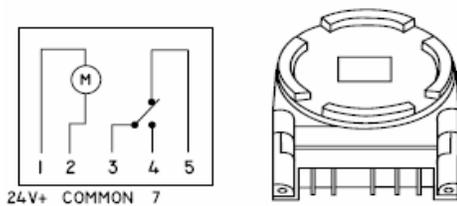
**Mode 2:** Same function as mode 1, except the close timer may time out, even with the Free Exit, OOLD, IOLD or Shadow detector inputs active. If the close timer has counted to zero, the gate will close when all detector inputs are clear.

**Mode 3:** Same functions of mode 1, however the close timer is forced to zero when both the OOLD & IOLD are tripped simultaneously. Additionally, all other close inputs are memorized and the gate closes immediately when all open commands and vehicle detector inputs are clear.

**Mode 4:** Full Anti-tailgate logic. Mode 3 functions, plus the gate will stop during the opening cycle when both the OOLD & IOLD are tripped simultaneously. When the OOLD & IOLD loops are cleared, the gate closes immediately. The OOLD and IOLD can be individually set so that, if tripped while closing, the gate may pause only or reverse to reopen. The free exit detector input is blocked while the gate is closing.

## 24 hr 7 day Timer Connection to Smart Touch Controller

This option generates an open command, which will hold the gate open until released.



Connect Timer Power Pin 1 to 24v (+)  
 Connect Timer Power Pin 2 to common  
 Connect Timer Com Pin 3 to common  
 Connect Timer NO Pin 4 to #7, Time Clock Open

### Selecting AM/PM or Military Time

After pressing reset, the display may show AM. The numbered day symbols will be flashing on and off. If the display does not show AM, it is in military time mode. To change to AM/PM mode, press and hold the **h** key and press the **±1h** key once. AM will appear in display. If display is in AM mode and military mode is desired, press and hold the **h** key, press the **±1h** key once.

### Setting the Time

Press and hold the **⊖** key during the following:  
 (If Daylight Savings Time is in effect, press **±1h** first)

1. Press **h** to advanced to the current hour, while holding down the **⊖** key.
2. Press **m** to advance to the current minute, while holding down the **⊖** key.
3. Press **Day** repeatedly to advance to current day, while holding the down the **⊖** key.

NOTE: If the days are flashing, it indicates the day of the week was not set when setting the time. The timer cannot be programed unless the day of the week is entered. Each year, in the spring, press **±1h** to advance the time an hour. In the fall, press **±1h** to set back an hour.

### Programming 24 hour or 7 day Schedules

*It is helpful to write out the program schedules before beginning.*

#### EXAMPLE

**Program 1:** ON at 7:00AM Monday thru Saturday

**Program 3:** Off at 7:00PM Saturday

**Program 2:** OFF at 5:00PM Monday thru Friday

### Programming 24 hour or 7 day Schedules Continued...

#### These Programs need to be entered:

- |   |  |
|---|--|
| Program 1: Press the <b>⏏</b> key once<br>Press <b>h</b> key<br>Press <b>m</b> key once<br>Press <b>Day</b> key once<br>Press <b>Prog.</b> key to enter   | ON symbol <b>⊙</b> appears to 07 AM to 00<br>123456 is displayed       |
| Program 2: Press the <b>⏏</b> key twice<br>Press <b>h</b> key<br>Press <b>m</b> key once<br>Press <b>Day</b> key twice<br>Press <b>Prog.</b> key to enter   | off symbol <b>⊖</b> appears to 05PM to 00<br>12345 is displayed        |
| Program 3: Press the <b>⏏</b> key twice<br>Press <b>h</b> key<br>Press <b>m</b> key once<br>Press <b>Day</b> key twice<br>Press <b>Prog.</b> key to enter<br>Press <b>⊖</b> key to enter Run Mode | off symbol <b>⊖</b> appears to 07PM to 00<br>until only 6 is displayed |

**IMPORTANT:** If an "ON" time was programed that is earlier than the current time, press **⏏** once to turn the timer "ON". (It does not "look back" to determine if it should be on or off after programing.)  
*Up to 20 Programs are able to be entered at one time.*

### Reviewing Programs

To review the programs at any time, press **Prog.** key. Programs will appear in the order they were entered with repeat presses of the **Prog.** key. After all programs have been reviewed, the blank display will appear to allow entering another program.

### Manual Override

TEMPORARY: While in the run mode, pressing, the **⏏** key once will reverse the output; ON to OFF or OFF to ON. The **⏏** symbol appears in the display to indicate a temporary override. At the next scheduled switching time, automatic control resumes eliminating the override. Continuous: While in the run mode...

\* Pressing the **⏏** key twice will turn the output to ON permanently. **⊙** symbol appears in display.

\* Pressing the **⏏** key three times will turn the output to OFF permanently. **⊖** symbol appears in display.

\* To terminate a continuous override, press the **⏏** key until **⊖** appears in the display.

10/27/00 24/7timer

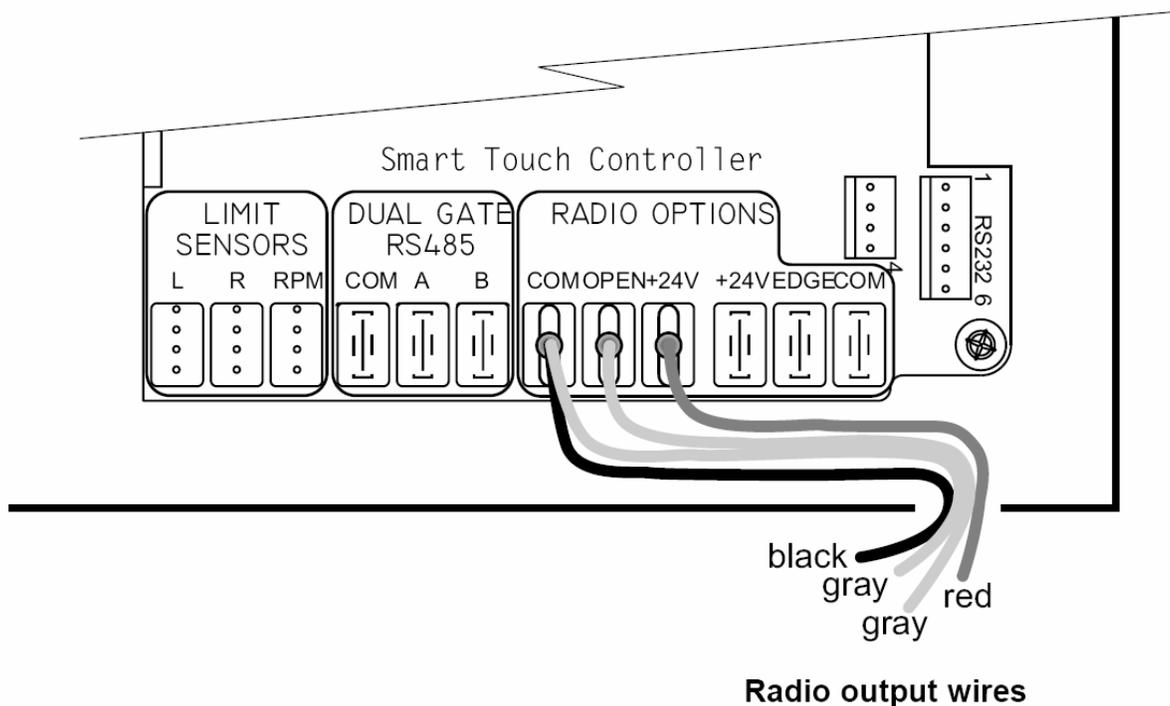
## Connecting a Radio Receiver for Remote Open

Mount a commercial style 24VDC radio receiver (external antenna type) on the inside of the operator, below the electrical box. Knock out the smallest hole in the lower right corner of the electrical box and route the wires to the area marked Radio Options. Only three wire connections are needed because the 24-Volt supply and the radio output share a wire. Being certain to observe polarity, crimp the black radio power wire together with one of the radio output wires into a .25" spade connector and connect to the COM terminal. Connect the red wire to the +24V terminal and connect the other radio output contact wire to the spade marked OPEN. Note that this terminal is the same as the #4 input terminal labeled REMOTE OPEN AND RADIO CONTROL on the main control board.

Mount an external antenna onto the top of a fixed post of the fence near the operator. Connect the antenna into the socket on the radio receiver.

Set the "DIP" switches in the receiver to match the same code used in the transmitter.

If there is also to be an edge sensor transmitter to reverse the gate, be certain to use a two channel commercial receiver. Remember that each transmitter and receiver must have their codes set the same or they will not function.

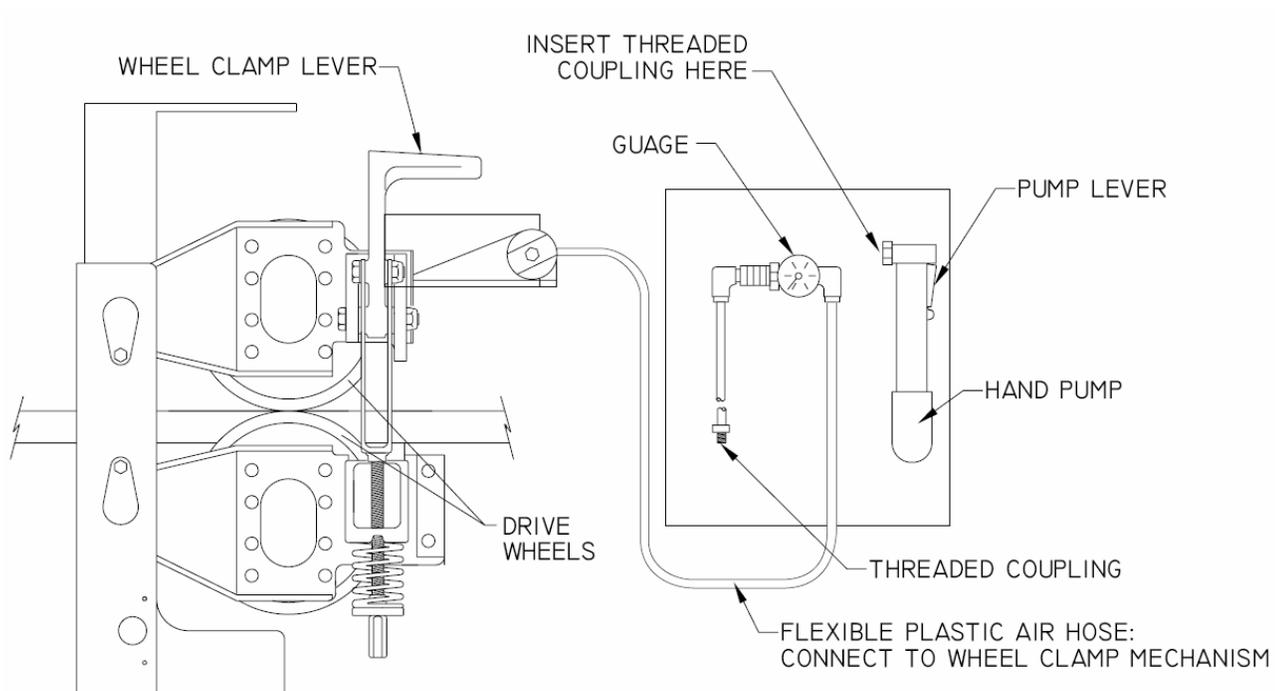


## Remote Release Mechanism

### Instructions for Releasing Drive Wheel Clamp Mechanism for Manual Operation

This remote release device consists of an air cylinder inside the operator, which pushes the wheel clamping device open, a length of flexible air tubing, and a remote box containing a hand pump. The hand pump is similar to the type used to inflate sports equipment or bicycle tires.

1. Remove hand pump from box. (Pull straight out to remove from mounting clips.)
2. Push threaded coupling, attached to end of tubing, into hand pump. Do not screw or twist.
3. Lock coupling in place by toggling the locking lever away from pump.
4. Pump until gauge pressure indicates 50 PSI. The clamp on the wheel should now be released and the gate can be manually operated. Do not release pressure until all manual operations are complete.
5. When ready for automatic operation, release fitting from pump by lowering lever and pulling tubing straight out. This will release the pressure on the wheel clamp mechanism.
6. Put pump and tubing back into enclosure.
7. Re-engage the release mechanism inside the gate operator housing.



## Troubleshooting

### Also review Page 13, Mechanical and Hydraulic Adjustments

#### Trouble with Gate Movement in General:

1. Disengage the operator from the gate and move the gate manually. If the gate does not roll well or is warped, fix the gate before working on the gate operator.
2. For adequate grip, the red spring that clamps the drive wheels must be compressed to 2" in height. Adjust by unclamping and turning the nut at the bottom of the threaded rod.
3. Look inside the operator under the wheels for metal shavings. Shavings indicate that the gate panel or the operator is out of alignment. Realign the operator as necessary. The operator must always be square to the gate and the drive rail must be shimmed if necessary to maintain an in/out tolerance of 1/4" throughout full gate travel.

#### Electrical Problems in General:

The Smart Touch Controller reports system malfunctions on its LCD display and the buzzer will emit a series of chirps at defined intervals. Review the matrix of Alerts, Faults and Errors listed on the next page. To disclose the status of all inputs on the terminal strip, the LED tact button must be pushed. This button is in the upper left corner near the Stop input.

#### Specific Types of Problems:

*"I pushed the open and close buttons, but nothing runs."*

1. Verify that the line voltage is present and matches the operator voltage + 10%.
2. Verify that control voltage is present at the power supply Common and 24VDC terminals. It may be necessary to reset the circuit breaker (black button) on the transformer.
3. Verify a jumper wire joins Common to Stop, if an external stop button is not used.
4. Verify there are no Faults or Errors reported on the LCD display. See table on next page.
5. If the motor VFD intermittently shuts off, voltage drop due to undersized wires is the likely cause. See page 62 for maximum allowable length of wiring runs vs. wire size.

*"The pump is running but the wheels are slow or not turning at all."*

*(Hydraulic pressure is between 0 - 700 PSI on the gauge)*

1. Verify VFD display reads 50Hz or greater during normal operation. If not reading >50Hz, verify deceleration switches and ramps are installed correctly.
2. If the motor has been replaced, verify CCW motor rotation. To reverse, switch any two AC lines between the motor and the VFD.
3. Check the level of the hydraulic oil by removing the plug in the reservoir. If necessary, add oil at this location to within one inch of the filler hole.
4. Unplug the hoses and run the pump. If the pressure is low, adjust the relief valve.
5. If relief valve does not respond to adjustment, remove it entirely and depress the plunger at the nose end with a blunt tool (Allen wrench) and blow it to remove any debris.

*"Hydraulic pressure is above 1100 PSI"*

1. Unclamp and spread the drive wheels, then retest. If the wheels turn, verify that the gate will move by manually pushing it. Fix the gate hardware if necessary.
2. Verify that the hose end quick disconnects are fully seated when connected.
3. Loosen brake valves a little by turning clockwise.

*"The wheels turn backwards, or only in one direction."*

1. Check hose connections for correct handing.
2. Press the Open button and verify that the directional Valve coil develops a strong pull. (This can be tested by removing the nut retaining the coil and grasping the coil)

*"The gate only opens or only closes."*

1. If the gate only opens, the directional valve is probably stuck and needs replaced.
2. If the gate only closes, the valve coil is not being energized, or is defective.

## Troubleshooting

The Smart Touch Controller system includes many self diagnostics. The LCD displays specific messages and the Audio Alert buzzer sounds distinctive chirps. Any Alerts, Faults or Errors are also logged into memory and date/time stamped. For diagnostic purposes these messages can be retrieved with optional START software available from HySecurity (see bottom of page 32). The following chart lists problem codes detected by the Smart Touch Controller.

Error, Fault, or Alert Status	LCD Display	Reads	Buzzer Chirp Sequence
Cannot respond due to tripped IES sensor or operator is in entrapment mode	Entr	Entr	2 chirps/sec every 2 seconds while control input is active
Safety Mode Alert	SAFE	SAFE	2 chirps once when in Safety Mode
Low 24V Control Voltage Alert (AC or DC)	Lo24	Lo24	N/A (display flashes 1 sec every 5 seconds)
Critical Low Power (AC or DC )	bAdP	bAdP	1 chirp every 3 seconds – controls disabled
Dead 24V Battery Alert – DC only	bat - dEAd	bat – dEAd	3 chirps upon any operating command
Gate Forced Open Alert	ALE1	ALE1	2 pulses/sec for 30 seconds
Gate drift closed Alert	ALE2	ALE2	2 pulses/sec for 10 seconds
Motor thermal overload Alert	ALE4	ALE4	2 chirps/sec once every 15 seconds
Both Limits Tripped Alert	ALE5	ALE5	2 chirps/sec every 15 seconds
Limits not released in 10 seconds	ALE6	ALE6	2 chirps/sec every 15 seconds
Loop detector freq change alert	ALE7	ALE7	2 chirps/sec every 15 seconds
Loop shorted to ground alert	ALE8	ALE8	2 chirps/sec every 15 seconds
Loop open (disconnected) alert	ALE9	ALE9	2 chirps/sec every 15 seconds
Loop detector comm. alert	AL10	AL10	2 chirps/sec every 15 seconds
Loop detector failed alert	AL11	AL11	2 chirps/sec every 15 seconds
Loop detector active >5 minutes	AL12	AL12	2 chirps/sec every 15 seconds
General I2C Comm. Buss failure	AL16	AL16	2 chirps/sec every 15 seconds
Bad 3V coin battery	AL17	AL17	2 chirps/sec every 15 seconds
False slow down signal	AL19	AL19	2 chirps/sec every 15 seconds
Lock Intrk (Input #22) Blocks Open	AL20	AL20	2 chirps/sec every 15 seconds
Maximum Run Fault	FAL1	FAL1	1 chirp once every 15 seconds
Photo eye Fault (supervised)	FAL2	FAL2	2 chirps/sec once per minute
Critical AC sag – bad supply wire	FAL3	FAL3	2 chirps/sec once per minute
Open or Closed limit failed	FAL5	FAL5	2 chirps/sec once per minute
Directional Motion Error	Err1	Err1	3 chirps/sec once per minute
Disconnected IES Error	Err2	Err2	3 chirps/sec once per minute
Serial comm. internal Error	Err3	Err3	3 chirps/sec once per minute or 3 on Cmd.
Serial comm. mast/slave Error	Err4	Err4	3 chirps/sec once per minute
EEPROM Data Error (factory)	Err7	Err7	3 chirps/sec once per minute
EEPROM Data Error (installer)	Err8	Err8	3 chirps/sec once per minute
EEPROM Data Error (user menu)	Err9	Err9	3 chirps/sec once per minute
Open or Close slow down switch failed	Er10	Er10	3 chirps/sec once per minute
Memory Checksum Error	FAiL	Fail	3 chirps/sec once per minute

**The green LED near the “coin” battery on Smart Touch controllers is the “heartbeat” of the processor. This LED always blinks at a steady pace, to indicate normal operation.**

**Gate Speed:** The speed at which a hydraulic operator moves a gate is determined by the size of the pump and the size of the actuator components. Just like a gear box, this speed is not adjustable. Attempting to slow a gate by changing a valve setting produces inefficiency and heat. If the speed of a gate must be changed, contact Tymetal. Extremely cold weather is unlikely to seriously affect the speed of the gate, because Tymetal and HySecurity employ a special grade of hydraulic oil that we call *Uniflow* oil, which maintains a linear viscosity over a broad range of temperatures. Because of this high quality oil and other design considerations, we rate our operators for service in ambient temperatures of -40F degrees to 130F degrees. If the speed of your operator has been affected by cold weather, verify that the gate hardware is not impaired by ice and verify that the reservoir is filled with *Uniflow* oil. Consider adding a heater in extreme weather.



## General Maintenance

### Hydraulic System

**Fluid Level:** Under normal conditions, hydraulic systems do not consume oil. Before adding any oil, check the system thoroughly for leaks. Remove the bright metal plug in the tank, fill to plug level, then replace plug. We only recommend our *Uniflow* hydraulic oil; part number **H004 1.0**, which is sold in one-gallon containers by our distributors. **Never use brake fluid. It will severely damage the entire hydraulic system. Use of any oil other than Uniflow oil voids the operator warranty.**

**Look for leaks:** Occasionally there may be slight seeping at the fittings after some usage. Tightening of the fittings usually corrects the problem. If leaking persists, replace "O" rings, fittings or hoses, if required. No further leaks should occur.

**Oil Change:** A hydraulic system does not foul its oil, unlike a gas engine. Oil changes do not need to be frequent. Tymetal/HySecurity recommends draining the reservoir and replacing the oil at five-year intervals. Oil breakdown caused by heat is the main concern. If the unit is subjected to high use, especially in a warm climate, change the oil more frequently.

To change the hydraulic oil, remove the reservoir from the pump unit, completely empty it, wipe the reservoir clean, and clean the derby screen before re-assembling. Refill with new *Uniflow* hydraulic oil (available from your distributor). To avoid overfilling, fill only through the removable plug opening near the tank top. Slowly pour the oil into the tank until the oil is within one inch of the filler port. Replace the plug and wipe up any spilled oil. Spilled oil will dry to a very sticky and messy consistency.

#### Cold Weather:

1. Check that your reservoir is filled with our *Uniflow* high performance oil.
2. Excessive ice build up can partly or totally jam gate operation. Check function by operating the gate manually.

### Electrical Controls

**Before servicing, turn off power disconnect switch**

No routine maintenance is needed for the electrical system or controls. If the environment is very sandy or dusty, or has many insects, be certain to seal all electrical enclosure holes. Blow the dust out of the electric panel with compressed air. A qualified technician may troubleshoot with the aid of the troubleshooting guide in this appendix. If it is necessary to call a distributor for assistance, be sure to have your model and serial number ready. Other helpful information would include the name of the job, approximate date of installation, and operator service record, especially any work that has been done recently.

**How to Adjust the Pressure Relief Valve:** To check your relief valve setting, first disconnect the hoses. Run the operator either open or closed (the gate will not move with the hose disconnected). The pressure gauge will show current relief pressure. The relief valve is found on the rear of the hydraulic power unit. It has an adjusting head and lock nut.

To adjust, loosen the lock nut and screw the threaded bolt clockwise for increased pressure, counterclockwise to decrease pressure.

MODEL  
VF2, VF3

FACTORY RELIEF SETTING  
1350 PSI

*There is limited value in using the relief valve as an entrapment protection device. Photo eyes or gate edges are the best methods to protect pedestrians and maintain reserve power to reliably drive the gate.*

Pressure Relief Valve



## Maintenance Schedule

### TYM-HYD Operator Maintenance Schedule

Name of part	What to do	Check at these recommended monthly intervals						
			1	3	6	12	60	
Gate and hardware	Check for damage and wear	*1	X					
Drive wheels	Check for tightness and wear	*2		X				
Wheel clamp spring	Check for clamping tension	*3		X				
Stop limit switches	Check for adjustment	*4		X				
Deceleration switches	Check for adjustment	*4			X			
Anchor bolts	Check for tightness				X			
Fluid level	Check for loss of fluid	*5				X		
Hydraulic fluid	Drain and replace fluid							X
Clock battery	Replace	*6						X

#### Special Notes:

\*1. Your gate and gate hardware will require more maintenance than your Tymetal operator. A damaged gate or worn hardware may cause slow or erratic operation and will result in excess drive wheel wear. Check gate hardware monthly and check for smooth operation by opening the toggle clamping mechanism and then pushing the gate manually. One person should easily be able to push all but the largest of gates. Damaged or warped gate panels should be straightened or replaced.

\*2. Normally, drive wheel life is many years. They are designed to avoid slipping on the rail. Wheels may be greatly shortened by any of these faults: clamping spring not adjusted correctly, operator misaligned in relation to gate panel, badly warped gate panel, extremely stiff gate hardware, and/or loose wheel mounting bolts (tighten to 25 ft. lb).

\*3. Verify that the red clamping spring is compressed tightly so that drive wheels apply a strong grip on drive rail. The red spring should normally be compressed to 2" in height.

\*4. The limit switch and deceleration switch rollers should ride  $\frac{1}{4}$ " to  $\frac{1}{2}$ " below the drive rail, near the center of the channel. Misadjustment may result in false or early tripping or no limit function at the end of travel. Verify that the limit trip ramps are tightly bolted to the drive rail.

\*5. The oil level should remain no less than one inch below the filler hole. See maintenance instructions for oil filling. Loss of fluid is not normal and indicates a leak that must be located and repaired. Use *Uniflow* fluid, part MX000970, if additional fluid is required.

\*6. Replace the Smart Touch Controller battery with DL 2025 / DL 2032 or CR 2025 / CR 2032.

## Use and Adjustment of the Manual Release Mechanism

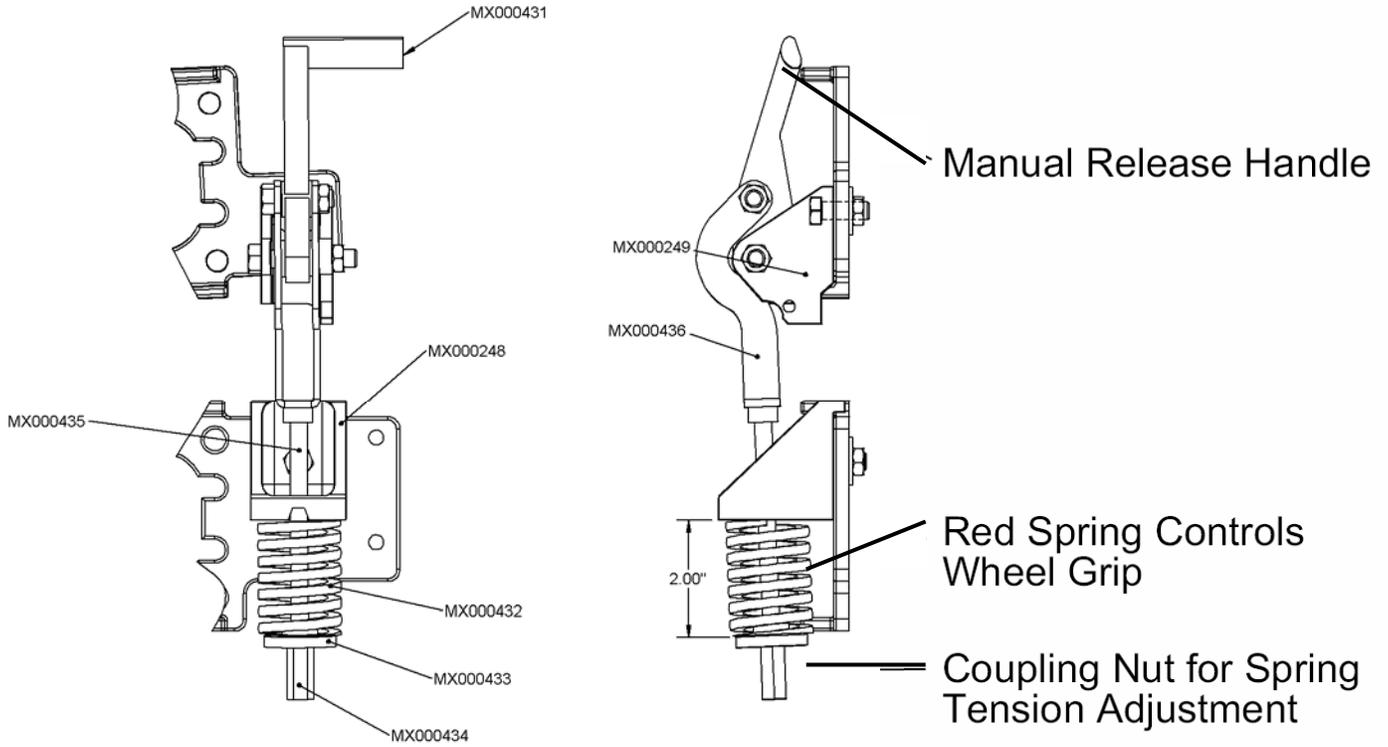
All TYM-HYD operators come equipped with a toggle handle manual release mechanism to disengage the drive wheels from the drive rail. The manual release is located under the electric control panel and to the right of the hydraulic motors. To disengage the drive wheels, simply pull the aluminum handle down.

**USE CAUTION:** At first, the toggle handle will rapidly pop down as the loaded spring releases. This action will cause the lower drive wheel to drop and disengage from the drive rail. When the coupling nut on the threaded rod drops to its lowest position, it will push on the base of the operator which will cause the upper drive wheel to lift and disengage from the drive rail.

For shipment, a piece of Styrofoam was placed between the coupling nut and the chassis. If the wood is still in place, discard it.

If the drive rail was installed at the correct height to the chassis, the manual toggle release mechanism will equally spread both wheels away from the drive rail. If the rail has been mounted higher than specified, it may be necessary to insert a 3/8" bolt into the bottom of the coupling nut which will create additional lift clearance for the upper drive wheel when manually released. If used, adjust the 3/8" bolt so the drive wheels spread equally when the manual toggle release is fully disengaged.

The coupling nut must always be adjusted correctly so that wheels provide a strong clamping force on the drive rail. The red spring should measure 2" to 2-1/8" in height when under correct compression.



MX001103 - TOGGLE HANDLE ASSEMBLY

## Wire Size Schedules

### For 1/2-hp through 5-hp motors

Supplying a gate operator with the right electrical service is crucial to the performance of the operator and the life of its electrical components. If the wire size used is too small, the voltage loss, especially during motor startup, will prevent the motor from attaining its rated horsepower. The percentage of horsepower lost is far greater than the percentage of voltage loss. A voltage loss could also cause the control components to chatter while the motor is starting, substantially reducing their life due to the resultant arcing. There is no way to restore lost performance resulting from undersized wires, except to replace them; Choose a sufficient wire size at initial installation to avoid costly rewiring.

The tables on the following page are based on copper wire and allow for a 5% voltage drop. The ampere values shown are the service factor ampere rating (maximum full load at continuous duty) of the motor. A 20 amp circuit (protected with a 20 Amp Inverse Time Breaker) should be provided, at minimum.

Always connect electrical power and ground the operator in accordance with the National Electrical Code, article's 430 and 250 plus other local codes that may apply.

The maximum distance shown is from the gate operator to the power source; assuming that source power is from a panel box with adequate capacity to support the addition of this motor load. The values are for one operator, with no other loads applied to the branch circuit. Avoid placing more than one gate operator to a circuit, but if you must, be certain to reduce the maximum allowed distance by half.

### Low Voltage Control Wiring:

The Smart Touch controller has very sensitive control inputs so the wire size of the control wiring is not a significant issue. The following is a chart of maximum distances for controls:

Wire Size	Maximum Distance
18 ga	7.0 miles
20 ga	3.5 miles
22 ga	2.7 miles
24 ga	2.0 miles
26 ga	1.0 mile
28 ga	3700 feet (.7 miles)

**Wire Size for Voltage Drop Over Distance**

**Wire Sizes for Power Wiring, Single Phase** Distances are shown in the unshaded boxes

Amps Horse Power	115 V, SINGLE PHASE					208 V, SINGLE PHASE					230 V, SINGLE PHASE							
	10.0	11.06	14.4	27.2	NA	NA	5.5	6.1	7.6	14.2	16.2	NA	5.0	5.8	7.2	13.6	14.8	27.0
	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp
12ga	90	75	60	30			290	260	205	110	100		350	300	245	130	120	65
10ga	140	120	100	50			460	415	330	175	155		560	480	385	205	190	105
8ga	220	190	155	80			725	650	525	280	245		880	760	610	325	300	165
6ga	350	300	245	130			1,150	1,040	835	445	390		1,400	1,120	975	515	475	260
4ga	555	480	385	205			1,825	1,645	1,320	710	620		2,220	1,915	1,550	815	750	410
2ga	890	765	620	330			2,920	2,630	2,110	1,130	1,000		3,550	3,060	2,465	1,305	1,200	660

Wire Gauge

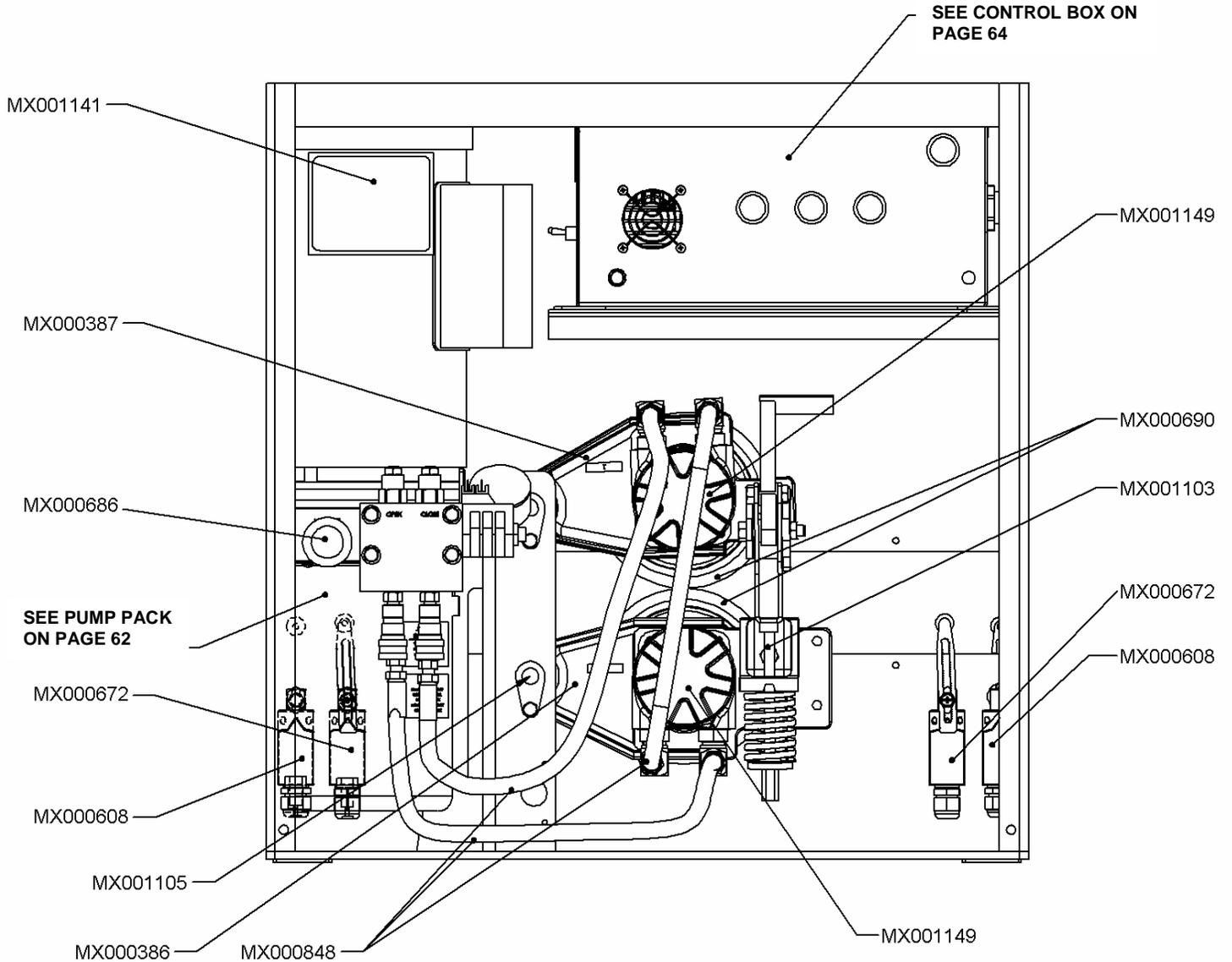
**Wire sizes for Power Wiring, Three Phase** Distances are shown in the unshaded boxes

Amps Horse Power	208 V, THREE PHASE					230 V, THREE PHASE					460 V, THREE PHASE							
	2.7	3.1	4.2	6.5	6.7	16	2.4	3.0	3.8	6.2	6.4	15.4	1.2	1.5	1.9	3.1	3.2	7.7
	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp	1/2hp	3/4hp	1hp	2hp	3hp	5hp
12ga	590	510	375	245	235	100	730	585	460	280	270	115	2,915	2,350	1,850	1,130	1,100	455
10ga	930	810	600	390	375	160	1,160	930	730	450	435	180	4,640	3,710	2,930	1,800	1,740	725
8ga	1,475	1,285	950	615	595	250	1,835	1,470	1,160	710	690	285	7,340	5,870	4,650	2,840	2,750	1,150
6ga	2,350	2,045	1,510	975	945	400	2,925	2,340	1,845	1,130	1,095	455	11,700	9,350	7,400	4,550	4,400	1,800
4ga	3,720	3,240	2,390	1,545	1,500	630	4,625	3,700	2,920	1,790	1,735	720	18,500	14,800	11,700	7,200	7,000	2,900

Wire Gauge

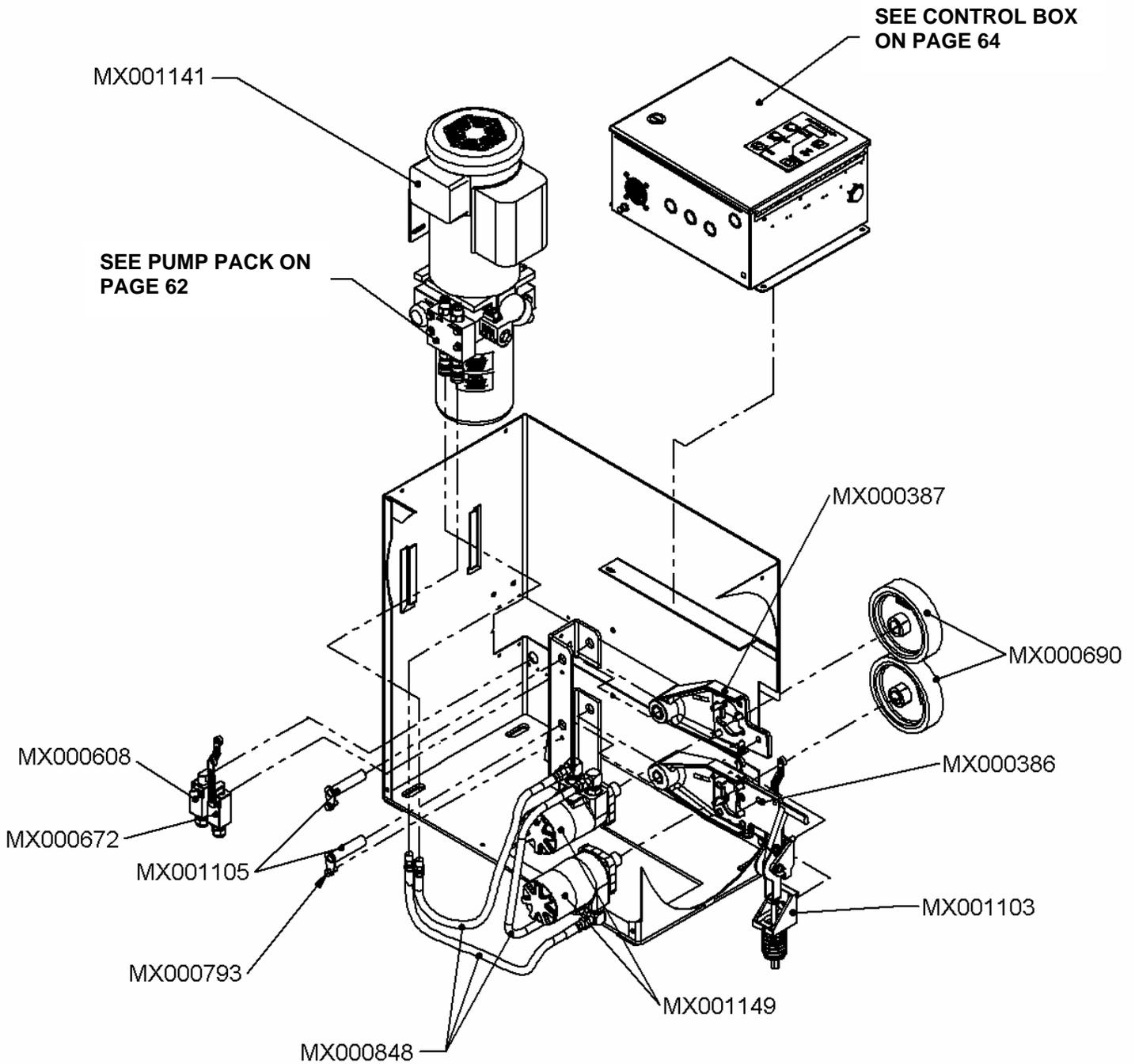
Always connect in accordance with the National Electrical Code, article 430, and other local codes that may apply.

## Exploded Parts Diagram – Front View



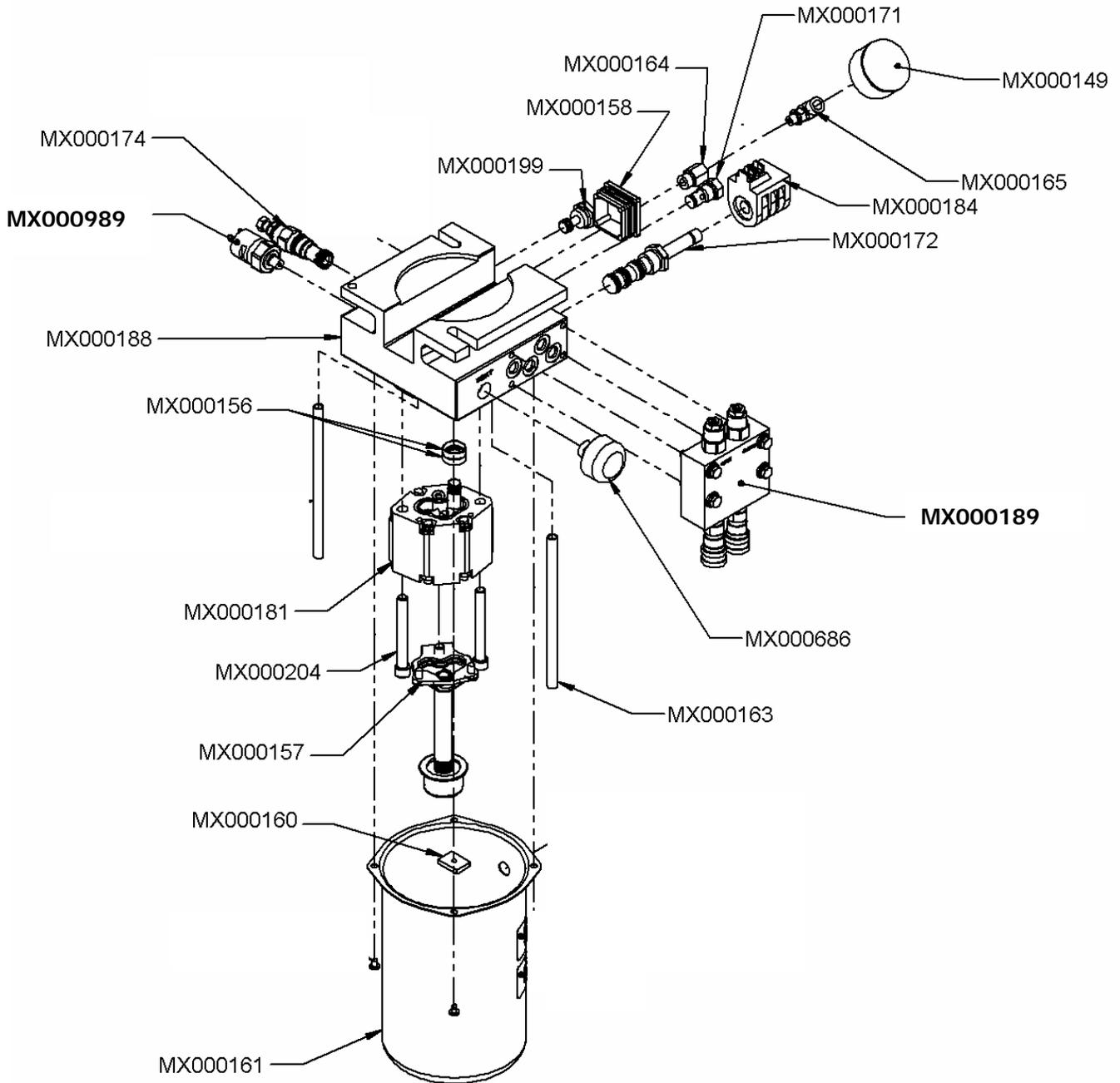
Part Number	Part Description
MX000387	TOP MOTOR MOUNT
MX000690	8" WHEEL AND HARDWARE
MX000386	BOTTOM MOTOR MOUNT
MX001103	MANUAL RELEASE TOGGLE ASSEMBLY
MX001149	MOTOR ASSEMBLY, 10"
MX000848	HOSE ASSEMBLIES 22", 25" & 30"
MX001105	MOTOR MOUNT PIN KIT
MX000686	BREATHER CAP
MX000672	OPEN/CLOSE LIMIT SWITCH
MX000608	SLOW DOWN LIMIT SWITCH

## Exploded Parts Diagram – Angle View



Part Number	Part Description
MX000387	TOP MOTOR MOUNT
MX000690	8" WHEEL AND HARDWARE
MX000386	BOTTOM MOTOR MOUNT
MX001103	MANUAL RELEASE TOGGLE ASSEMBLY
MX001149	MOTOR ASSEMBLY, 10"
MX000848	HOSE ASSEMBLIES 22", 25" & 30"
MX001105	MOTOR MOUNT PIN KIT
MX000672	OPEN/CLOSE LIMIT SWITCH
MX000608	SLOW DOWN LIMIT SWITCH

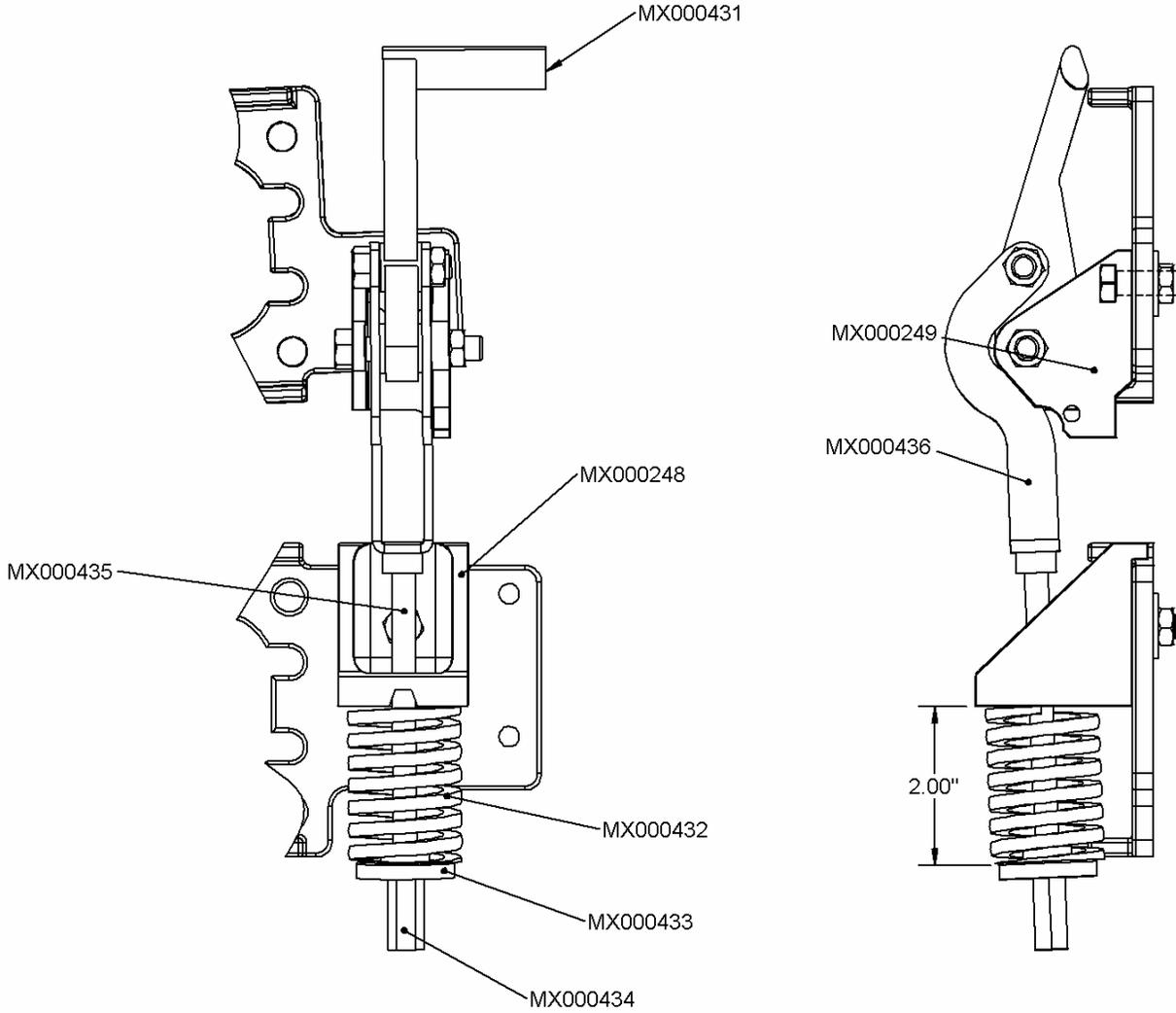
# Pump Pack



Part Number	Part Description
MX000149	2000 PSI GAUGE
MX000171	VALVE, 8GPM
MX000165	ADAPTER FITTING W/ O-RING, -4-2
MX000164	ADAPTER FITTING W/ O-RING, -6-4
MX000184	DIRECTIONAL COIL
MX000172	SOLENOID VALVE, 2P4W, 3000PSI
MX000158	SQUARE PLASTIC CAP, 1.75"
MX000199	CAVITY PLUG, 2W2P
MX000189	BRAKE MANIFOLD

Part Number	Part Description
MX000686	BREATHER CAP, 0.375"
MX000163	RESEVOIR RETURN TUBE, 7"
MX000161	RESEVOIR, 4 QT
MX000160	MAGNET, 0.75" X 1"
MX000157	RESEVOIR INLET PLUMBING KIT
MX000181	PUMP, 4.0 GPM
MX000156	SHAFT SEAL, 0.5 X 0.875
MX000188	ALUMINUM ENDHEAD
MX000989	IES SENSOR
MX000174	RELIEF VALVE, 3000PSI

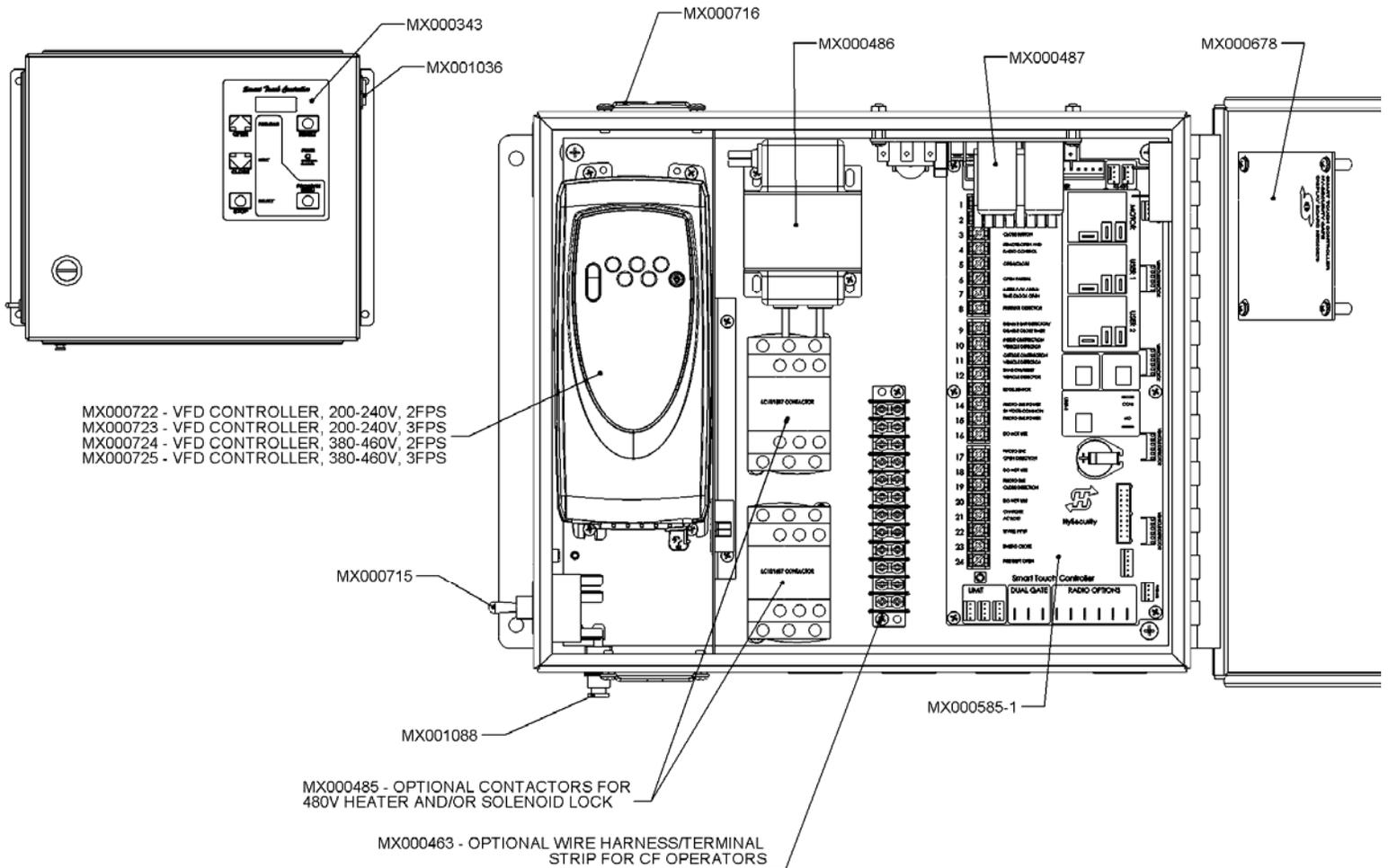
# Manual Release Toggle Assembly



MX001103 - TOGGLE HANDLE ASSEMBLY

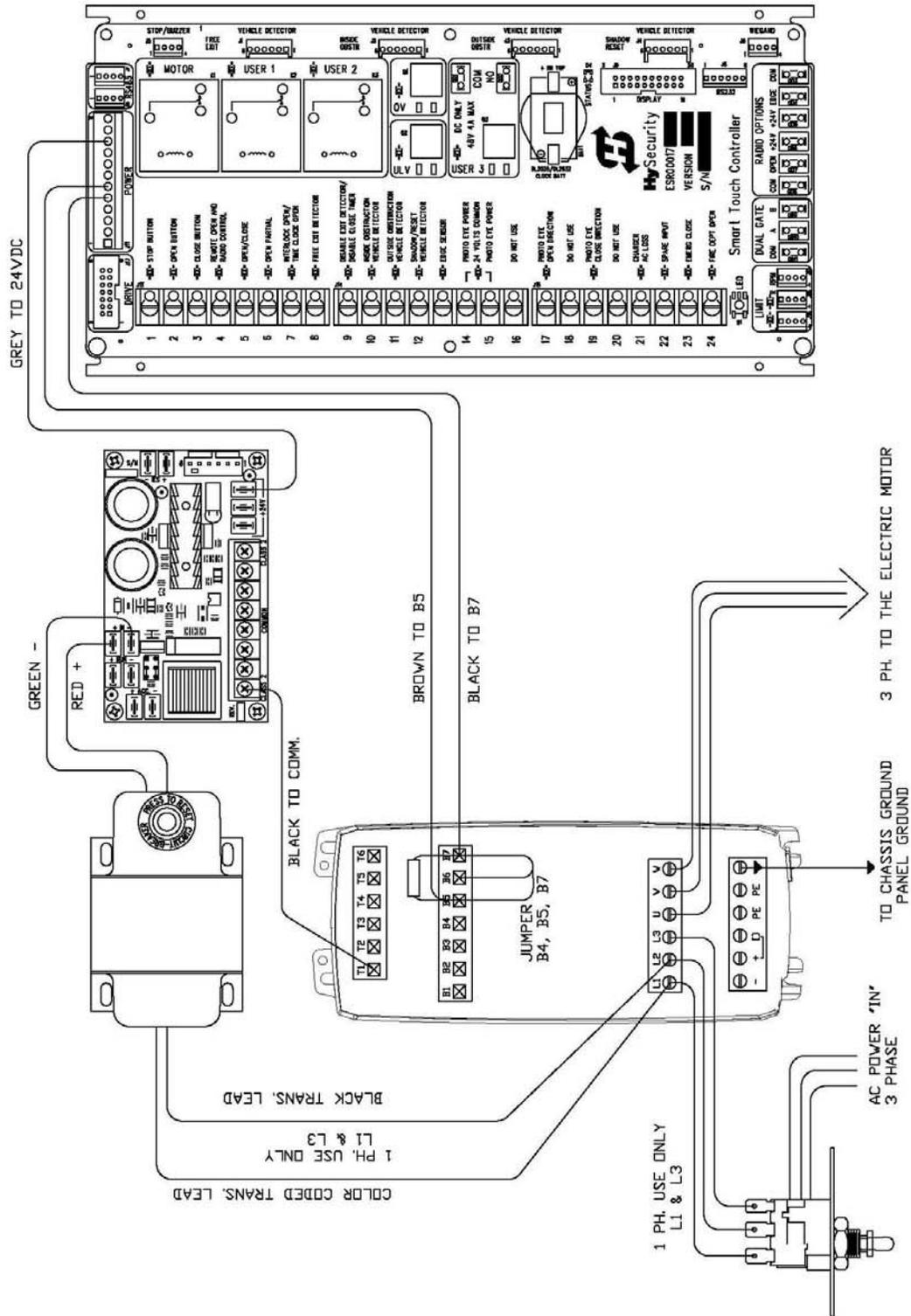
Part Number	Part Description
MX001103	COMPLETE TOGGLE ASSEMBLY
MX000436	TOGGLE YOKE
MX000249	TOGGLE HANDLE MOUNT
MX000434	NUT COUPLER, 3/8-16
MX000433	DRIVE TOGGLE SPRING SEAT
MX000432	DRIVE TOGGLE SPRING
MX000248	TOGGLE SPRING MOUNT
MX000435	TENSION SCREW 3.8-16 X 5.5"

# Control Box Electric Enclosure



Part Number	Part Description
MX000343	5 BUTTON MEMBRANE KEYPAD
MX001036	PIEZO BUZZER ALARM
MX000722	VFD CONTROLLER, 200-240V, 2FPS
MX000723	VFD CONTROLLER, 200-240V, 3FPS
MX000724	VFD CONTROLLER, 380-460V, 2FPS
MX000725	VFD CONTROLLER, 380-460V, 3FPS
MX000715	POWER SWITCH
MX001088	INTERNAL RESET SWITCH
MX000485	CONTACTOR RELAY, 18A/32A
MX000463	COMPLETE TERMINAL STRIP (OPTIONAL)
MX000585-1	SMART TOUCH CONTROL BOARD, AC
MX000678	DISPLAY BOARD
MX000487	POWER SUPPLY BOARD
MX000486	TRANSFORMER, 75 VA, 115/230V
MX000716	60MM FAN COVER

# VFD Control Box Layout



## TYM-HYD Wheel Change

Instructions written for installing wheels with retaining collars.

1. Remove drive wheel assembly from TYM-HYD.
2. If the old wheel is equipped with a locking collar, loosen the two (2) 3/16" Allen head bolts holding the clamp (requires a wrench at least 4" long for 8" wheels).
3. Pry back the "Star Washer" tabs from around the drive wheel bolt.



Remove bolt and drive wheel. A wheel puller or other mechanical means may be required to slide the wheel off the motor shaft. Remove old clamp (if any).



4. Clean debris from shaft (emery cloth works well), and replace the motor shaft key with the key included in the installation kit.



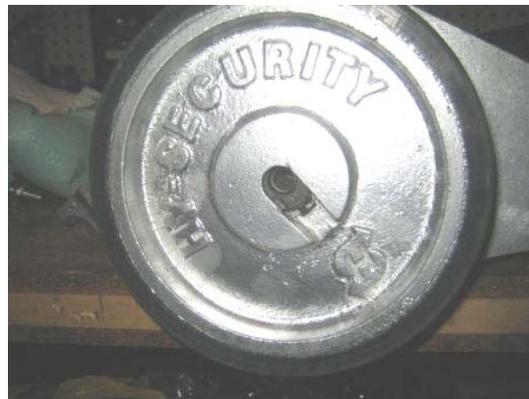
5. Locate new wheel and locking collar.



6. Place the locking collar on the machined inside hub on the replacement wheel (collar splits between hub splits) and lightly tighten. Be sure the collar is seated against the back of the wheel hub.



7. Slide new drive wheel (with collar) onto the motor shaft and seat with mallet.



8. Install bolt, new washer and new "star washer" on wheel/motor assembly.



9. Hand tighten the bolt until the wide tab of the star washer is lined up with the slot in the drive wheel.



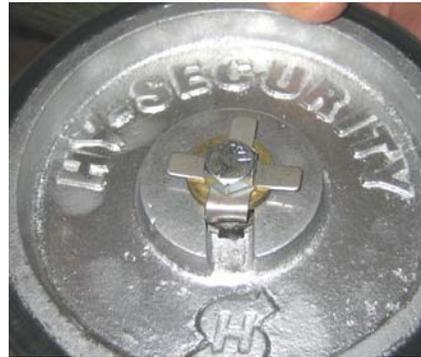
10. Bend the wide tab down into the groove with a screwdriver and hammer, or pliers.



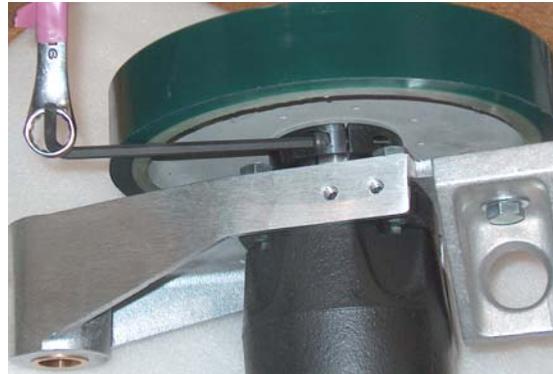
11. TIGHTEN BOLT TO APPROXIMATELY 25 FT\*LBS.



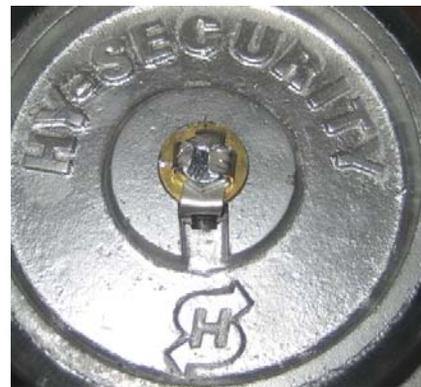
12. After torquing the bolt to 25 FT\*LBS, continue to tighten the bolt until the flat sides of the bolt head line up with the 2 opposing small washer tabs. Skip this step if they are already lined up.



13. Use a 3/16" Allen wrench to tighten the (2) bolts securely. Be sure the collar is seated against the back of the wheel hub, with the collar splits between the wheel hub splits. (If not fully seated against the wheel, the collar may contact the motor mounting bolts during operation.)



14. Bend retaining clip tabs around the motor shaft bolt head until they are snug as shown.



15. Re-install the drive wheel assembly in the operator.

## LIMITED WARRANTY

### 1. Warranty.

Hy-Security Gate, Inc. (“HySecurity”) warrants that at the time of sale each of its products will, in all material respects, conform to its then applicable specification and will be free from defects in material and manufacture. This warranty does not extend to items listed as “accessories” in HySecurity’s price list, when those items carry another manufacturer’s name plate and they are not a part of the base model. HySecurity disclaims all warranties for such accessory components, which carry only the original warranty, if any, of their original manufacturer. HySecurity hereby assigns its rights under such manufacturer warranties to buyer.

HySecurity further warrants that the following components will, with recommended maintenance and without being subjected to extraordinary or abnormal use or abuse, remain serviceable for the following periods, which begin on the date that the product is shipped from HySecurity:

- a. All Gate Operators: Five Years or 500,000 gate cycles whichever comes first.
- b. Hydraulic Gate Operator Drive Wheels: Two Years
- c. Batteries in D.C. operators: One Year from date of battery manufacture.
- d. New replacement parts: One Year

Any modification made to products will void the warranty unless the modifications are approved in writing by HySecurity, in advance of the change. This exclusion does not apply to normal installation of approved accessories and/or safety devices. This warranty shall not apply to equipment that has been (1) improperly installed or installed contrary to instructions; (2) subjected to negligence, accident, vandalism, or damaged by severe weather, wind, flood, fire, or war; or (3) damaged through improper operation, maintenance, storage or abnormal use or abuse.

**THIS IS THE ONLY WARRANTY GIVEN BY HYSECURITY AND IS IN PLACE OF ALL OTHERS.** This warranty extends to HySecurity’s distributors and to the first user of its products.

### 2. Exclusion of Other Warranties.

The warranties contained in Section 1 are the exclusive warranties given by HySecurity and supersede any prior, contrary or additional representations, whether oral or written. Any prior or extrinsic representations or agreements are discharged or nullified. **HYSECURITY HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES—WHETHER EXPRESS, IMPLIED, OR STATUTORY—INCLUDING ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.**

### 3. Buyer's Exclusive Remedies for Any Nonconformity.

If a HySecurity product fails to conform to the warranties in Section 1, Buyer must notify HySecurity within a reasonable time and in no event more than thirty (30) days after the discovery of the nonconformity. HySecurity will investigate and, in the event of a breach, will provide, at its option and within a reasonable period of time, one of the following: (1) repair or replacement of any nonconforming products or components, or (2) refund of the purchase price upon return of the nonconforming items. Replacement goods will conform to this warranty for (1) the unexpired duration of the warranty period for the original, nonconforming product or (2) 90 days, whichever is longer. HySecurity reserves the right to supply used or repaired material for all warranty claims. This warranty does not cover or extend to any incidental expenses, including labor, shipping, travel time or standby time, that are incurred for inspection or replacement of any nonconforming items. As a condition of warranty coverage, warranty claims must be submitted in accordance with the following paragraph. **THE REMEDY SELECTED BY HYSECURITY IN ACCORDANCE WITH THIS PARAGRAPH SHALL BE THE EXCLUSIVE AND SOLE REMEDY OF BUYER FOR ANY BREACH OF WARRANTY.**

For warranty coverage, you must follow the procedures described on HySecurity’s form, “RMA Procedures.” A current version of the form is available from HySecurity and is also posted on HySecurity’s web site.

### 4. Exclusion of Consequential and Incidental Damages.

**IN NO EVENT SHALL HYSECURITY BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NONDELIVERY OR FROM THE USE, MISUSE, OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT OR FROM HYSECURITY’S OWN NEGLIGENCE OR OTHER TORT.** This exclusion applies regardless of whether such damages are sought for breach of warranty, breach of contract, negligence, or strict liability in tort or under any other legal theory.

### 5. Severability.

If any provision of this warranty is found to be invalid or unenforceable, then the remainder shall have full force and effect, and the invalid provision shall be partially enforced to the maximum extent permitted by law to effectuate the purpose of the agreement.

### 6. Applicable Law.

This Warranty will be interpreted, construed, and enforced in all respects in accordance with the laws of the State of Washington, without reference to its choice of law principles. The U.N. Convention on Contracts for the International Sale of Goods will not apply to this Warranty.