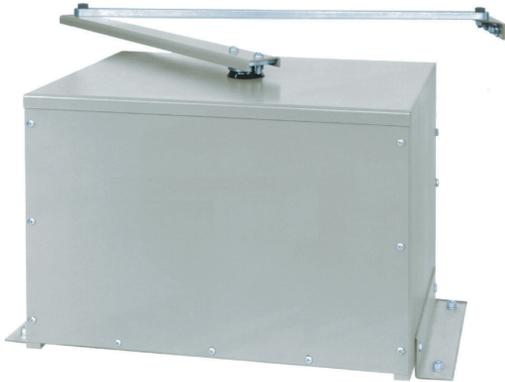


CHAMBERLAIN®

LiftMaster®
PROFESSIONAL



MODEL SW470
MEDIUM DUTY SWING GATE OPERATOR



MODEL SW490
HEAVY DUTY SWING GATE OPERATOR

2 YEAR WARRANTY

Serial # _____
(located on electrical box cover)

Installation Date _____

MODELS SW470 AND SW490 ARE FOR VEHICULAR PASSAGE GATES
ONLY AND NOT INTENDED FOR PEDESTRIAN PASSAGE GATE USE



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WARRANTY POLICY AND SERVICE

IMPORTANT NOTE

- BEFORE attempting to install, operate or maintain the operator, you MUST read and fully understand this manual and follow all safety instructions.
- These instructions are intended to highlight certain safety related issues. These instructions are not intended to be comprehensive. Because each application is unique, it is the responsibility of the purchaser, designer, installer and end user to ensure that the total gate system is safe for its intended use.

WARNING

Mechanical

WARNING

Electrical

CAUTION

When you see these Safety Symbols and Signal Words on the following pages, they will alert you to the possibility of serious injury or death if you do not comply with the warnings that accompany them. The hazard may come from something mechanical or from electric shock. Read the warnings carefully.

When you see this Signal Word on the following pages, it will alert you to the possibility of damage to your gate and/or the gate operator if you do not comply with the cautionary statements that accompany it. Read them carefully.

CARTON INVENTORY

Before beginning your installation check that all components were supplied and received undamaged. Refer to list below for factory supplied parts.

HARDWARE KITS SW470 (K77-SW470) & SW490 (K77-SW490)

Part No.	Description	Qty.
SW470		
02-401-SP	Stop Button	1
10-2108-T	Arm Channel	1
10-2109	Extension Arm	1
10-2111	Gate Bracket	1
40-3505	Warning Sign	2
80-2103	Black Plastic Knob	2
82-HN38-18	3/8 x 1-1/2 Hex Head Bolt	2
82-SB50-08	1/2-13 x 1/2 Shoulder Bolt	2
84-FN-38	3/8-16 Serrated Flanged Nut	4
85-FW-38	3/8" Flat Washer	2
SW490		
02-401-SP	Stop Button	1
06-2025-T	Arm Channel	1
08-2001	Extension Arm	2
10-2011	Gate Bracket	1
70-18618	Warning Sign	1
10-3900	39" Galvanized Steel Pipe	1
11-18619	Pivot Pin	1
12-10172	3/4 Bushing	2
40-18627	Label, Disconnect	1
40-3505	Warning Sign	2
80-207-20	3/8 x 3/8 x 1-1/2 Key	1
80-575	3/4 Flat Washer	4
82-HN38-16	3/8-16 x 1 Hex Head Bolt	2
82-HN75-28	3/4-10 x 3 Hex Head Bolt	1
82-NH38-06CP	3/8-16 x 3/8 Cone Point Set	6
84-RH-75	3/4-10 Hex Nut	1
85-LS-38	3/8 Lockwasher	2
86-CP05-300	Cotter Pin	2

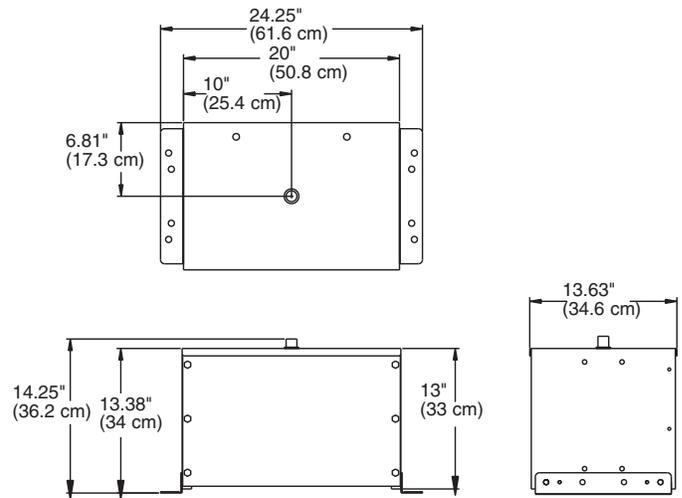
OPERATOR DIMENSIONS AND SPECIFICATIONS

MODEL SW470

- **1/2 HP Motor**

Maximum Gate Weight – **500 lbs. (226.8 kg)**

Maximum Gate Width – **12 ft. (3.7 m)**



MODEL SW490

- **1/2 HP Motor**

Maximum Gate Weight – **750 lbs. (340.2 kg)**

Maximum Gate Width – **16 ft. (4.9 m)**

- **3/4 HP Motor**

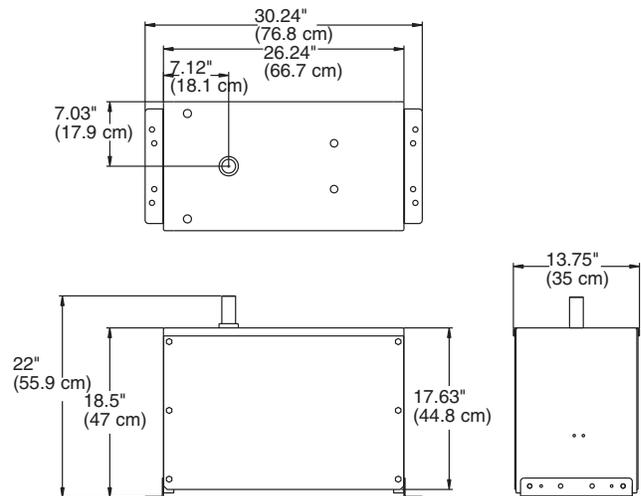
Maximum Gate Weight – **900 lbs. (408.2 kg)**

Maximum Gate Width – **19 ft. (5.8 m)**

- **1 HP Motor**

Maximum Gate Weight – **1000 lbs. (453.6 kg)**

Maximum Gate Width – **22 ft. (6.7 m)**



UL325 MODEL CLASSIFICATIONS

The SW470 and SW490 are intended for use with vehicular swing gates. The opener can be used in Class I, Class II, Class III and Class IV applications.

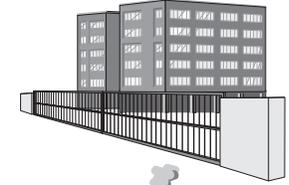
CLASS I – RESIDENTIAL VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a home of one-to four single family dwellings, or a garage or parking area associated therewith.



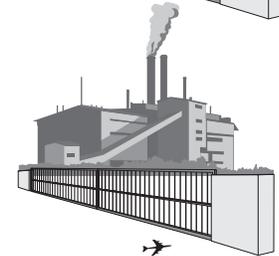
CLASS II – COMMERCIAL/GENERAL ACCESS VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units) hotel, garage, retail store or other building servicing the general public.



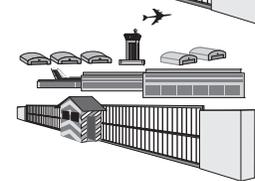
CLASS III – INDUSTRIAL/LIMITED ACCESS VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other location not intended to service the general public.



CLASS IV – RESTRICTED ACCESS VEHICULAR GATE OPERATOR

A vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.



SAFETY ACCESSORY SELECTION

All UL325 compliant LiftMaster gate operators will accept external entrapment protection devices to protect people from motorized gate systems. UL325 requires that the type of entrapment protection correctly matches each gate application. Below are the six types of entrapment protection systems recognized by UL325 for use on this operator.

ENTRAPMENT PROTECTION TYPES

Type A: Inherent obstruction sensing system, self-contained within the operator. This system must sense and initiate the reverse of the gate within two seconds of contact with a solid object.

Type B1: Connections provided for a non-contact device, such as a photoelectric eye can be used as a secondary protection.

Type B2: Connections provided for a contact sensor. A contact device such as a gate edge can be used for secondary protection.

Type C: Inherent adjustable clutch or pressure relief valve.

Type D: Connections provided for a control requiring continuous pressure to operate the operator open and close.

Type E: Built-in audio alarm. Examples include sirens, horns or buzzers.

NOTE: UL requires that all installations must have warning signs placed in plain view on both sides of the gate to warn pedestrians of the dangers of motorized gate systems.



UL325 ENTRAPMENT PROTECTION REQUIREMENTS

GATE OPERATOR ENTRAPMENT PROTECTION

UL325 Installation Class	Slide Gate Operator		Swing & Gate Barrier (Arm) Operator	
	Primary Type	Secondary Type	Primary Type	Secondary Type
Class I & II	A	B1, B2 or D	A or C	A, B1, B2, C or D
Class III	A, B1 or B2	A, B1, D or E	A, B1, or C	D or E
Class IV	A, B1, B2 or D	A, B1, B2, D or E	A, B1, C or D	A, B1, C, D or E

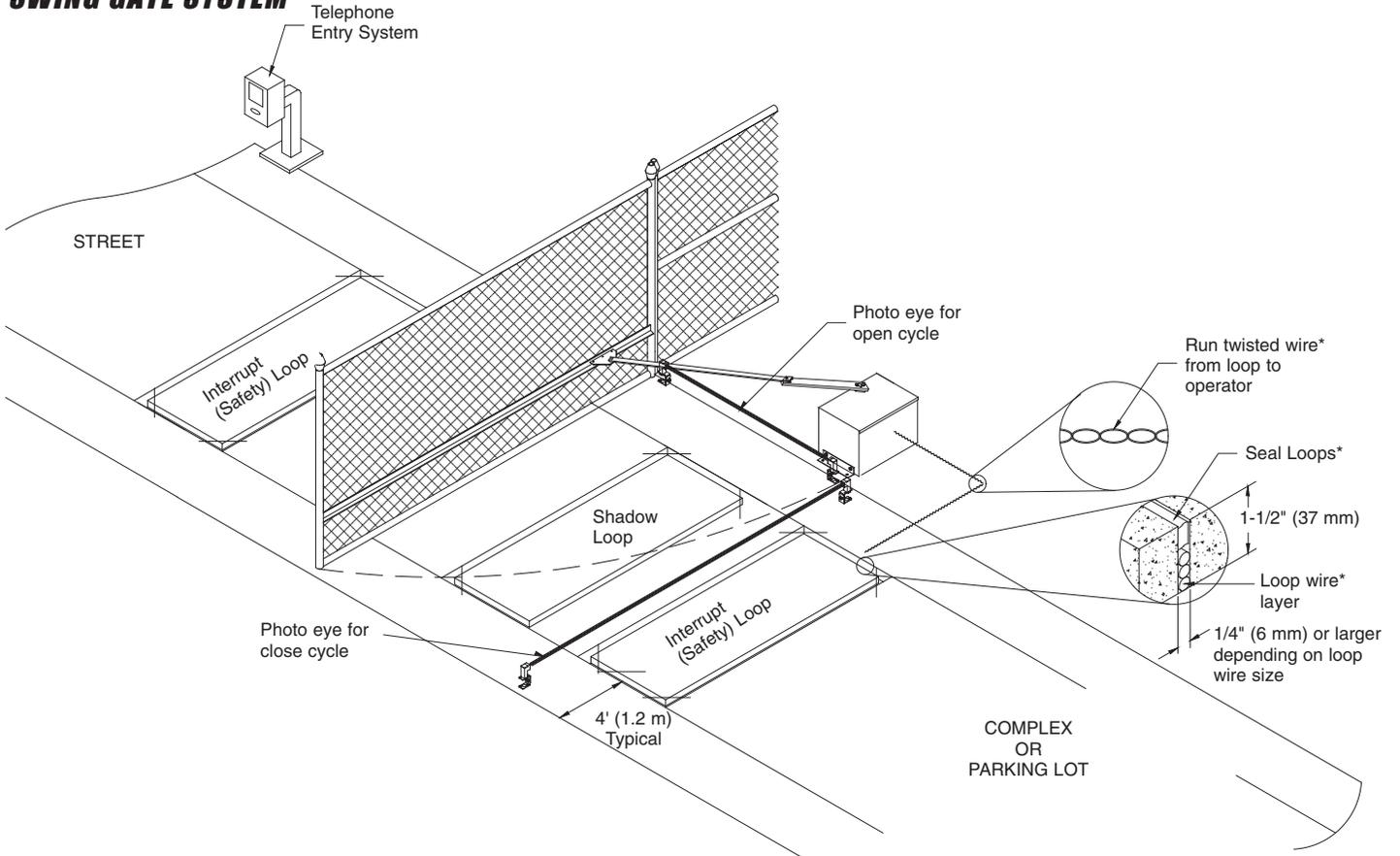
The chart above illustrates the entrapment protection requirements for each of the four UL325 classes.

In order to complete a proper installation you must satisfy the entrapment protection chart shown above. That means that the installation must have one primary means of entrapment protection and one independent secondary means of entrapment protection. Both primary and secondary entrapment protection methods must be designed, arranged or configured to protect against entrapments in both the open and close directions of gate travel.

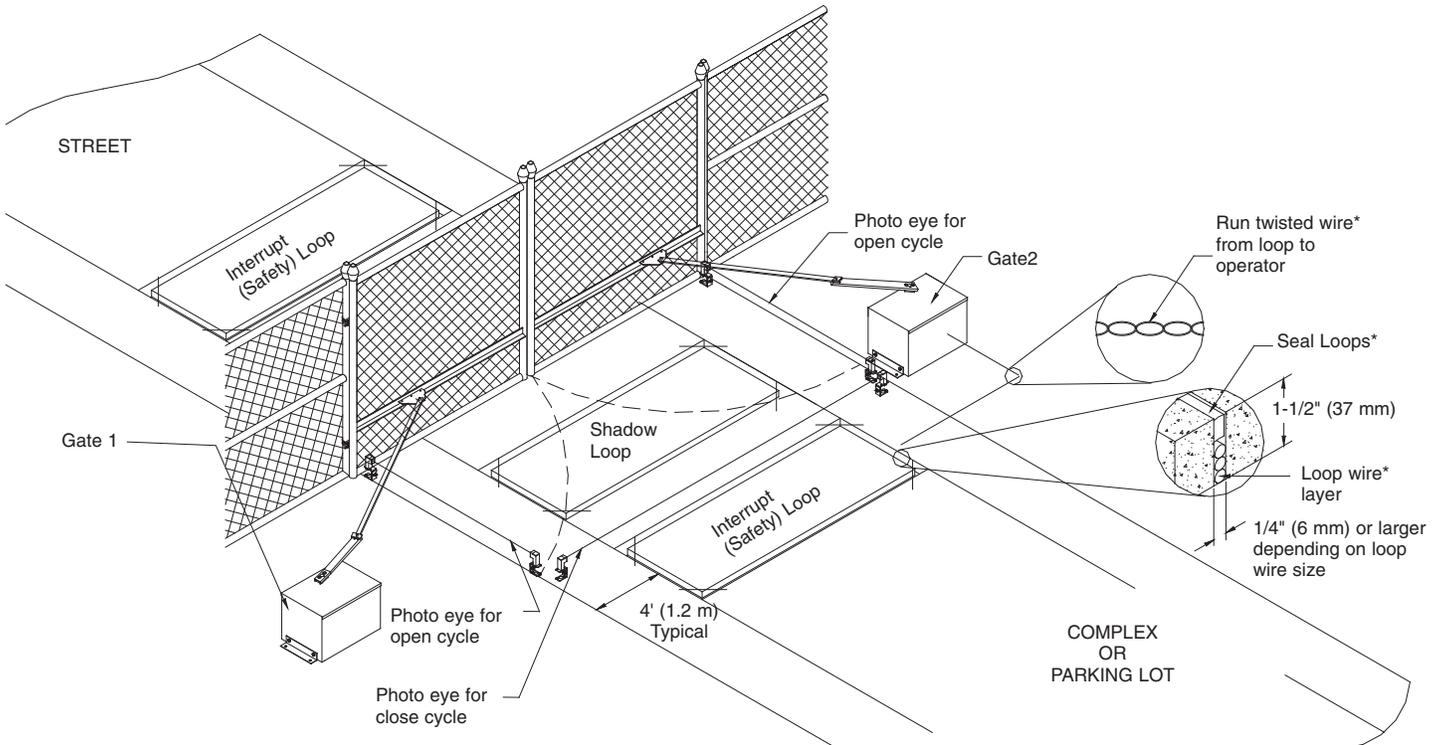
For Example: For a slide gate system that is installed on a single-family residence (UL325 Class I) you must provide the following: As your primary type of entrapment protection you must provide Type A- inherent (built into the operator) entrapment sensing and at least one of the following as your secondary entrapment protection: Type B1- Non-contact sensors such as photoelectric eyes, Type B2- Contact sensors such as gate edges or Type D- Constant pressure control.

SUGGESTED SAFETY PROTECTION DEVICE LOCATIONS

SWING GATE SYSTEM



DUAL SWING GATE SYSTEM



* REFER TO LOOP MANUFACTURER'S INSTRUCTIONS FOR DETAILED INSTALLATION & LOOP WIRING INSTRUCTIONS.

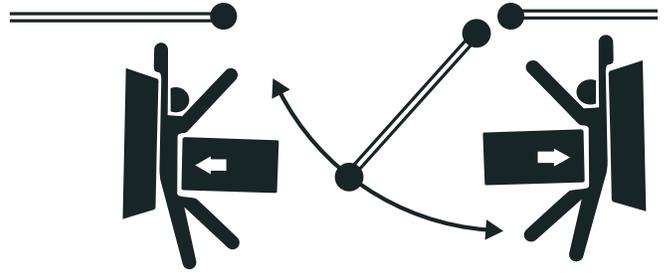
SAFETY INSTALLATION INFORMATION

1. Vehicular gate systems provide convenience and security. Gate systems are comprised of many component parts. The gate operator is only one component. Each gate system is specifically designed for an individual application.
2. Gate operating system designers, installers and users must take into account the possible hazards associated with each individual application. Improperly designed, installed or maintained systems can create risks for the user as well as the bystander. Gate systems design and installation must reduce public exposure to potential hazards.
3. A gate operator can create high levels of force in its function as a component part of a gate system. Therefore, safety features must be incorporated into every design. Specific safety features include:
 - Gate Edges
 - Guards for Exposed Rollers
 - Photoelectric Sensors
 - Screen Mesh
 - Vertical Posts
 - Instructional and Precautionary Signage
4. Install the gate operator only when:
 - a. The operator is appropriate for the construction and the usage class of the gate.
 - b. All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 4' (1.2 m) above the ground to prevent a 2 1/4" (6 cm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position.
 - c. All exposed pinch points are eliminated or guarded, and guarding is supplied for exposed rollers.
5. The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.
6. The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open into public access areas.
7. The gate must be properly installed and work freely in both directions prior to the installation of the gate operator.
8. Controls intended for user activation must be located at least six feet (6') away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls. Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.
9. The Stop and/or Reset (if provided separately) must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
10. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
11. For a gate operator utilizing a non-contact sensor:
 - a. Reference owner's manual regarding placement of non-contact sensor for each type of application.
 - b. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
 - c. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.
12. For a gate operator utilizing a contact sensor such as an edge sensor:
 - a. One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge and post mounted both inside and outside of a vehicular horizontal slide gate.
 - b. One or more contact sensors shall be located at the bottom edge of a vehicular vertical lift gate.
 - c. A hard wired contact sensor shall be located and its wiring arranged so the communication between the sensor and the gate operator is not subject to mechanical damage.
 - d. A wireless contact sensor such as the one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.
 - e. One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6" (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.
 - f. One or more contact sensors shall be located at the bottom edge of a vertical barrier (arm).

SAFETY PRECAUTIONS FOR SWING AND ORNAMENTAL "GRILL TYPE GATES"

⚠ WARNING

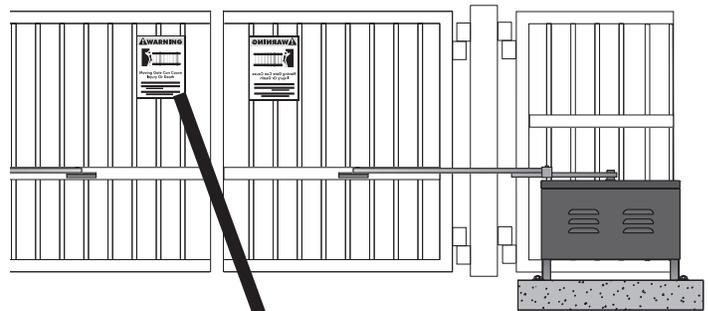
- To prevent **SERIOUS INJURY** or **DEATH** from a moving gate:
- Entrapment protection devices **MUST** be installed to protect anyone who may come near a moving gate.
 - Locate entrapment protection devices to protect in **BOTH** the open and close gate cycles.
 - Locate entrapment protection devices to protect between moving gate and **RIGID** objects, such as posts.
 - A swinging gate shall **NOT** open into public access ways.



WARNING SIGN PLACEMENT

⚠ WARNING

- To prevent **SERIOUS INJURY** or **DEATH** from a moving gate:
- Install warning signs on **EACH** side of gate in **PLAIN VIEW**.
 - Permanently secure each warning sign in a suitable manner using fastening holes.



INSTALLATION

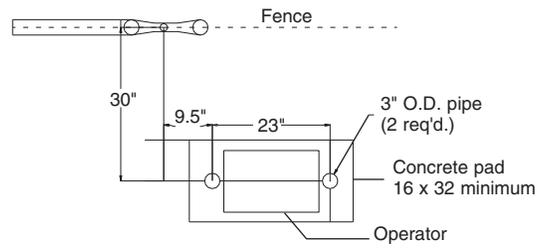
POST MOUNTING (SW470)

1. Locate and anchor two posts made of 3" (7.6 cm) outer diameter heavy walled pipe. Posts should be parallel and square to the gate.

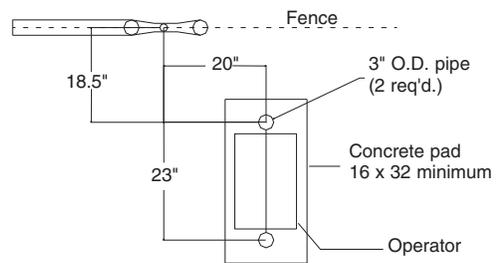
IMPORTANT NOTE: The distance between mounting posts and the relative location of the operator to the gate and fence is critical.

2. Locate electrical conduit, as required, prior to pouring concrete.
3. Set mounting post and electrical conduit in place (Figure 2). Knockouts for 3" pipe clamps (not supplied) are provided in the operator.

Figure 1

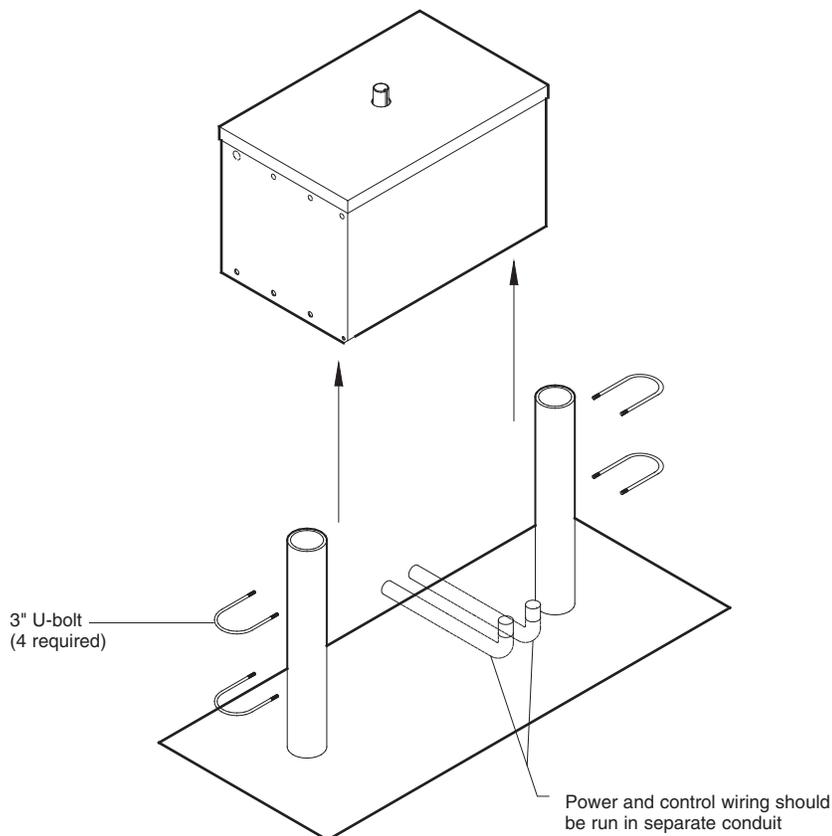


Parallel Mount



Perpendicular Mount

Figure 2



INSTALLATION

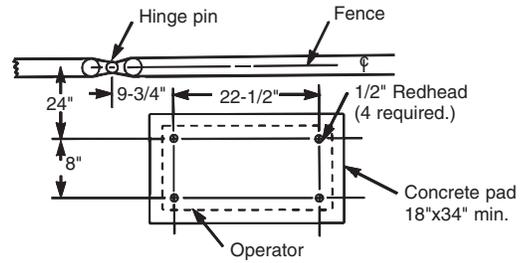
PAD MOUNTING (SW470)

1. Layout the concrete pad (Figure 1).

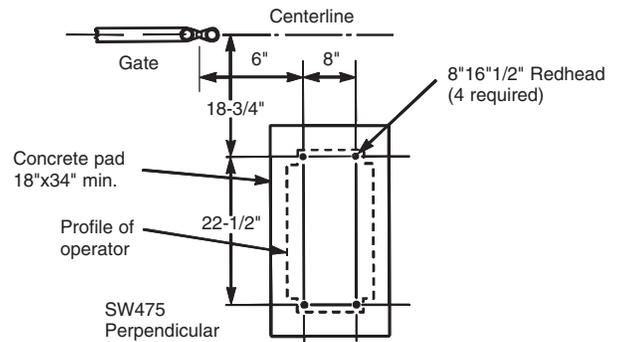
IMPORTANT NOTE: The relative location of the operator to the fence and the gate is critical. Be sure that the measurements for operator mounting are taken from the centerline of the fence and of the gate hinge.

2. Locate electrical conduit, as required, prior to pouring concrete.
3. Pour concrete pad.
4. Bolt the (2) pad mount brackets to the bottom of the operator with the hardware provided.
5. Secure the operator to the concrete pad. It is very important that the operator be level and square to the gate.

Figure 1

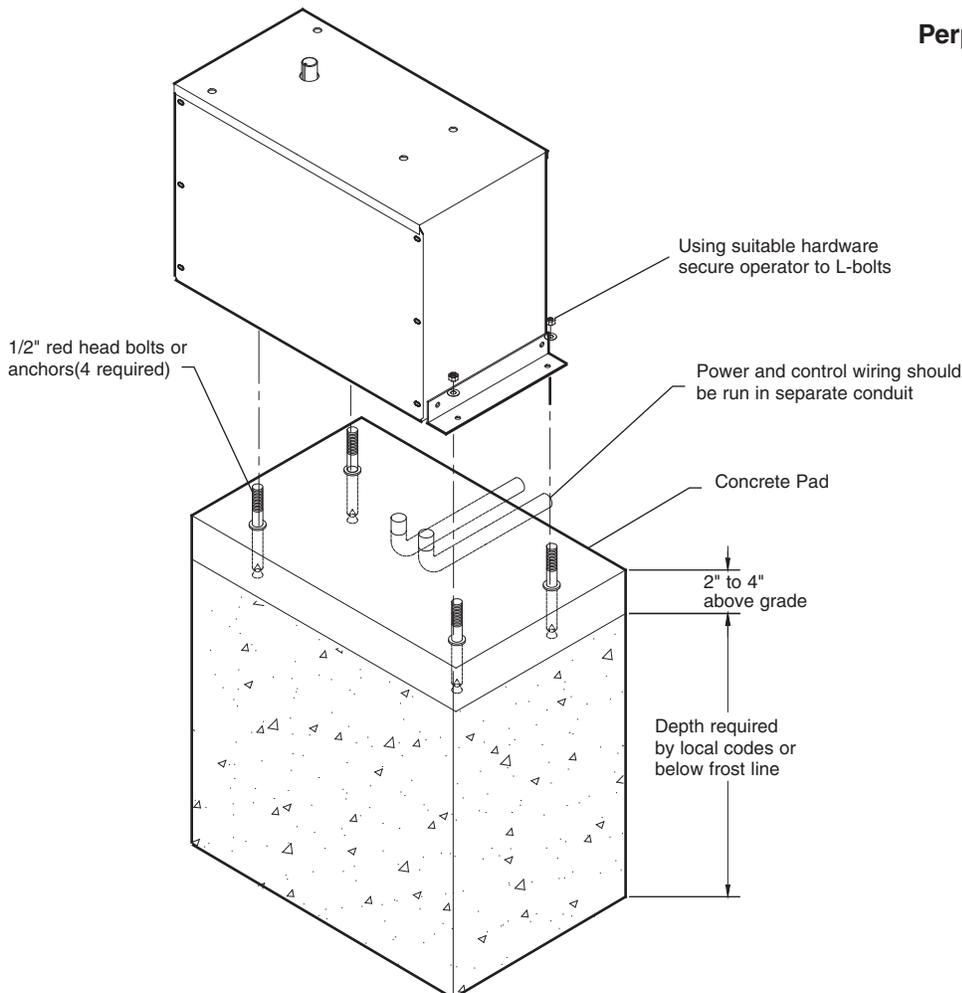


Parallel Mount



Perpendicular Mount

Figure 2



INSTALLATION

PAD MOUNTING (SW490)

1. Measure the gate length and select appropriate "P" dimension from the gate installation table.

2. Layout the concrete pad as detailed in Figure 1.

IMPORTANT NOTE: The relative location of the operator to the fence and the gate is critical. Be sure that the measurements for operator mounting are taken from the centerline of the fence and of the gate hinge.

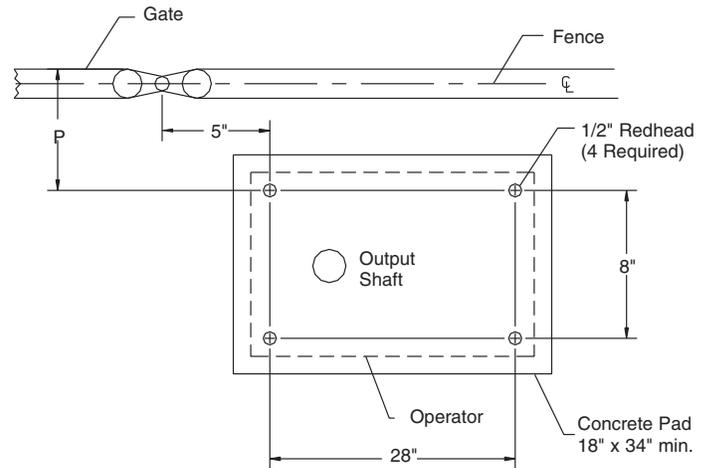
3. Locate electrical conduit, as required, prior to pouring concrete.

4. Pour concrete pad.

5. Bolt the (2) pad mount brackets to the bottom of the operator with the hardware provided (Install the operator so that the output shaft is on the side closest to the gate).

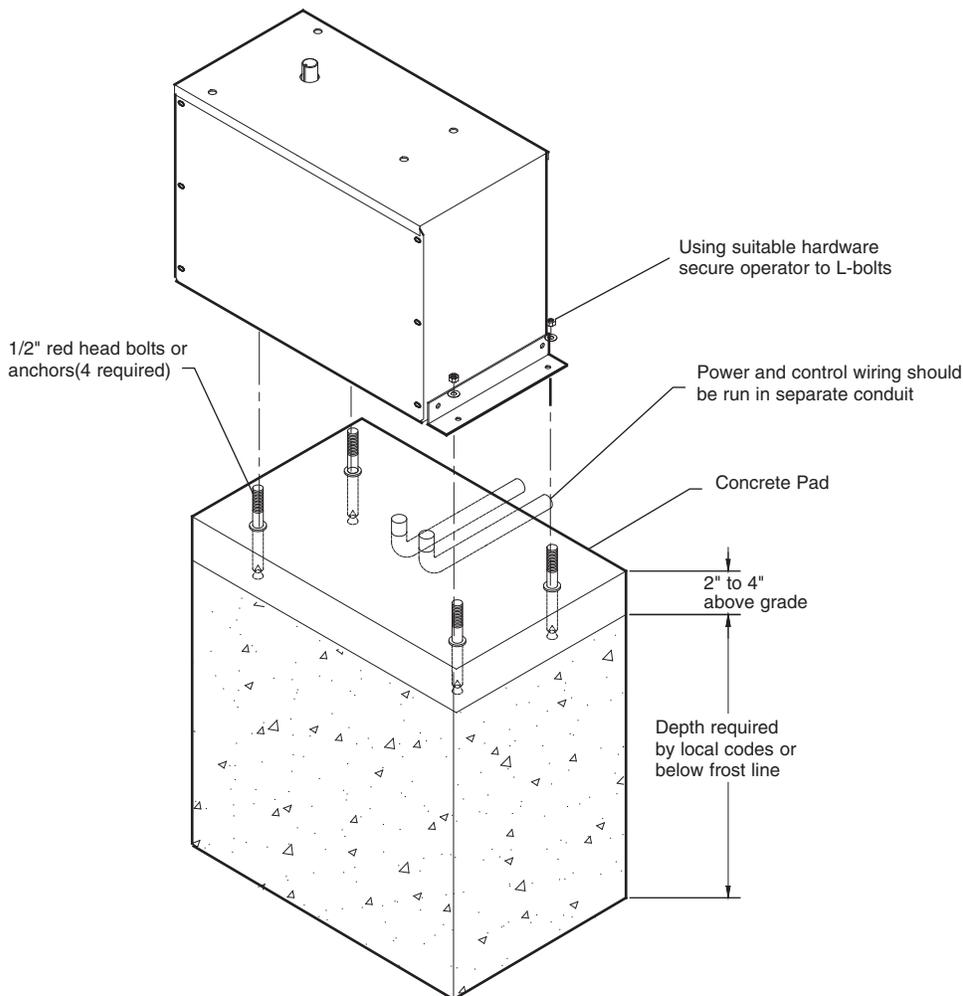
6. Secure the operator to the pad. It is very important that the operator be level and square to the gate.

Figure 1



GATE LENGTH (FEET)	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22
P DIMENSION IN INCHES	21.9	25.3	28.8	32.3	35.7	39.2	42.7	46.1

Figure 2

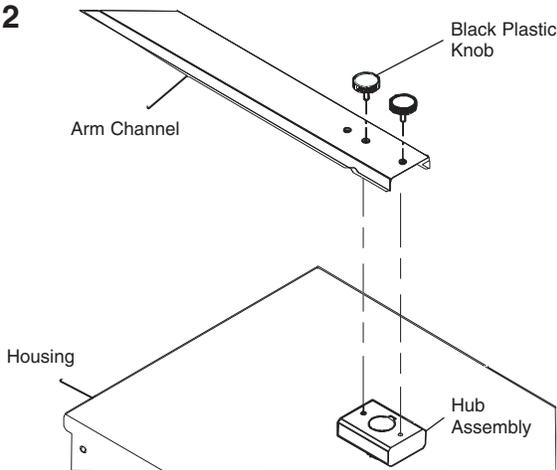


INSTALLATION

CONTROL ARM ASSEMBLY (SW470)

1. Set the control arm stop on the operator in the positions appropriate for the installation (Figure 1).
2. Install the arm channel to the hub assembly to the operator output shaft.
3. Secure the arm channel to arm hub with 1/4-20 black plastic knobs provided (Hub is factory installed - Figure 2).
4. Assemble extension arm to control arm. Be sure to keep the extension arm with spot-faced side up. Use the holes that are appropriate for desired degree of gate opening. The extension arm should swivel easily on pivot screws when the nuts are tightened. Attach the other end of the actuator arm to the gate brackets (Figure 3).

Figure 2



GATE BRACKET INSTALLATION (SW470)

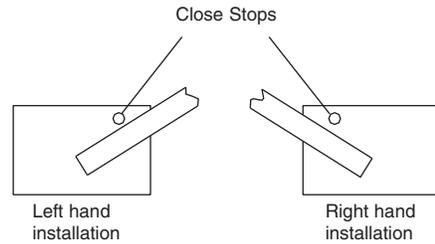
1. Install gate bracket (supplied) or install an angle (2" x 2" x 1/4" by others) horizontally on gate, at the same height as the top surface of the control arm extension (see figure to the right).
2. Adjust the eccentric stop as shown so that the wide area of the eccentric stop is against the arm. Be sure that the control arm and actuator are in a straight line. Install the gate bracket and if required install an angle (for SW490 2" x 2" x 1/4" by others) at the appropriate point on the gate in reference to gate hinge pin.

NOTE: As an alternative, (2) 3/8-16 bolts and a nut plate are provided. Adjust arm length and then rotate the eccentric stop 180 degrees so that the small thickness is against the arm. This will provide the necessary deflection in the arm assembly to lock the gate.

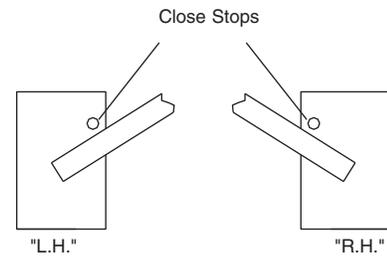
CAUTION

If the arm stop is installed incorrectly, the gate will be prevented from opening and damage to the operator may result!

Figure 1

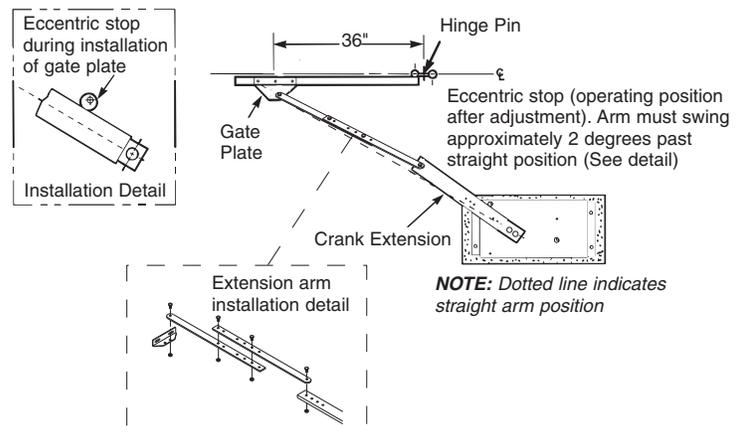


SW470 Parallel to Fence



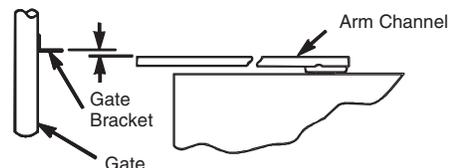
SW470 Perpendicular to Fence

Figure 3



Model SW470

Top of gate bracket should be mounted 1/2" higher than top of arm channel

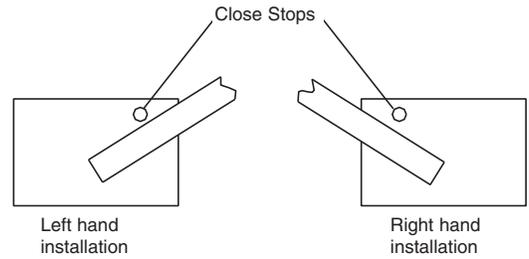


INSTALLATION

CONTROL ARM ASSEMBLY (SW490)

1. Set the control arm's close stop on the operator so that its position corresponds with the handling of the installation (Figure 1).
2. Remove the open stop, as it is not to be used in this application. Use any existing hardware necessary to seal the open stop's hole in the operator's cover.
3. Measure the length of the gate panel and select the appropriate extension arm (x) and control arm (Y) dimensions from the gate installation table.
4. Install the control arm hub assembly to the operator's output shaft. Make sure that the key is properly inserted into the hub assemblies keyway. Lock the key in place with using the set screw provided in the hub.
5. Attach control arm extension to control arm hub assembly by bolting or welding the two pieces together to achieve the proper control arm dimension (Y).
6. Determine the proper location of the gate bracket by measuring the gate panel's length and referring to the gate installation table (Dimension B) on the next page. Install the supplied gate bracket or install your own gate bracket (recommended 2" x 2" x 1/4" angle) horizontally on the gate and at the same height as the top surface of the control arm extension. Secure the gate bracket to the gate by either welding or bolting the bracket to the gate.
7. Assemble one extension arm holder to the gate bracket using supplied hardware (Figure 2).
8. Assemble the other extension arm holder to the control arm extension using the supplied pivot pin assembly and cotter pin (Figure 3).
9. Measure and cut pipe (not provided) and position the pipe into the extension arm holders to achieve the proper extension arm dimension (X). Insert the hex head set screws in each extension arm holder in order to hold pipe firmly. Do not tighten until testing and all final adjustment have been completed (Figure 4).

Figure 1



SW490 Parallel to Fence

Figure 2

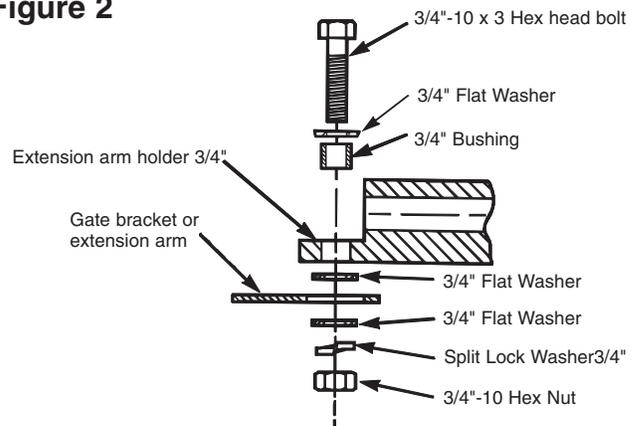


Figure 3

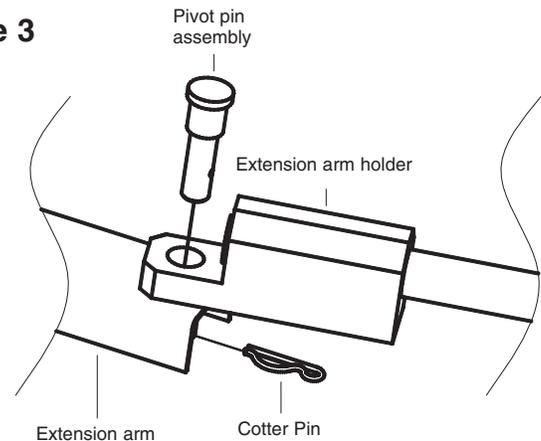
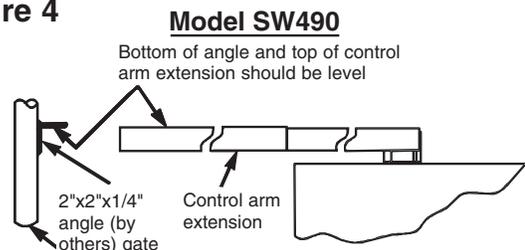
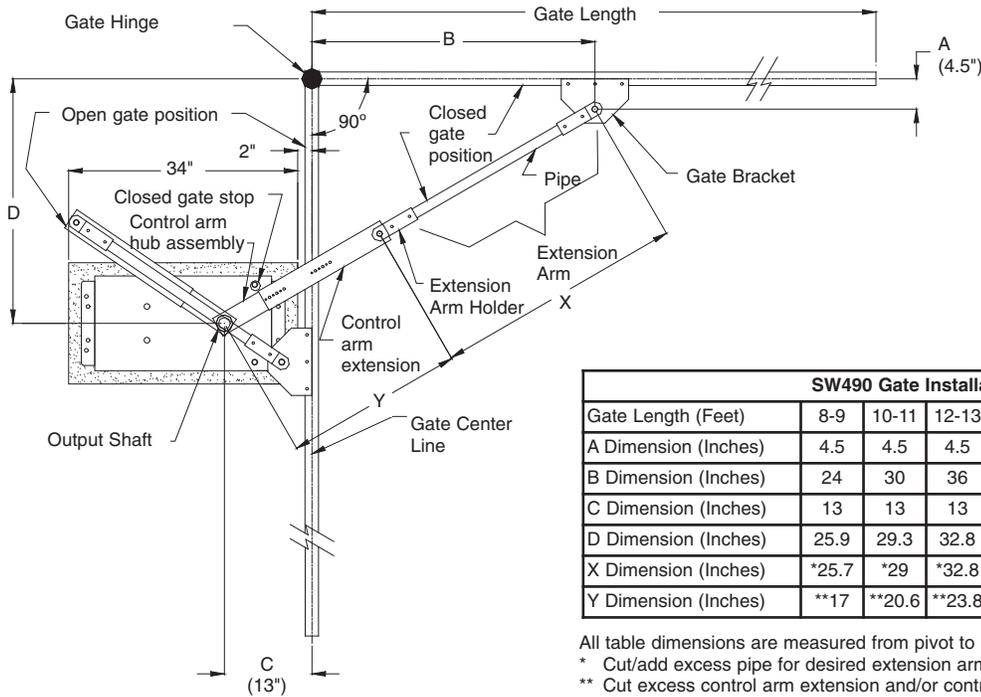


Figure 4



INSTALLATION

CONTROL ARM ASSEMBLY (SW490) continued



SW490 Gate Installation Table								
Gate Length (Feet)	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22
A Dimension (Inches)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
B Dimension (Inches)	24	30	36	42	48	54	60	66
C Dimension (Inches)	13	13	13	13	13	13	13	13
D Dimension (Inches)	25.9	29.3	32.8	36.3	39.7	43.2	46.7	50.1
X Dimension (Inches)	*25.7	*29	*32.8	*36.9	*41.2	*45.6	*50	*54.6
Y Dimension (Inches)	**17	**20.6	**23.8	26.6	29.3	31.8	34.2	36.6

All table dimensions are measured from pivot to pivot.

* Cut/add excess pipe for desired extension arm pivot to pivot dimension.

** Cut excess control arm extension and/or control arm hub assembly for desired pivot to pivot dimension. Weld or bolt extension arm to arm assembly.

MANUAL DISCONNECT

MODEL SW470

1. Remove the (2) black knobs securing the control arm to the operator (Figure 1).
2. Swing arm assembly off to the side. Gate should swing freely.

MODEL SW490

1. Remove hitch pin and pivot pin securing control arm to arm assembly (Figure 2).
2. Swing arm assembly off to the side. Gate should swing freely.

Figure 1

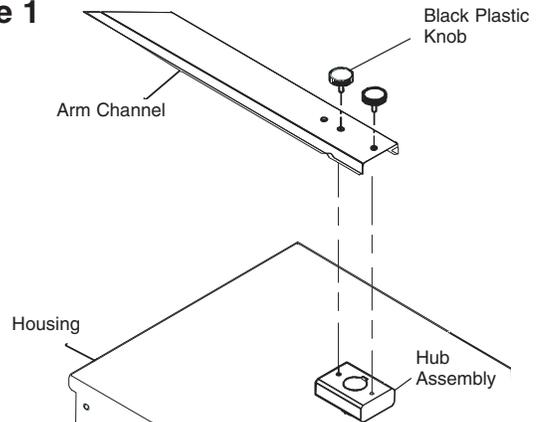
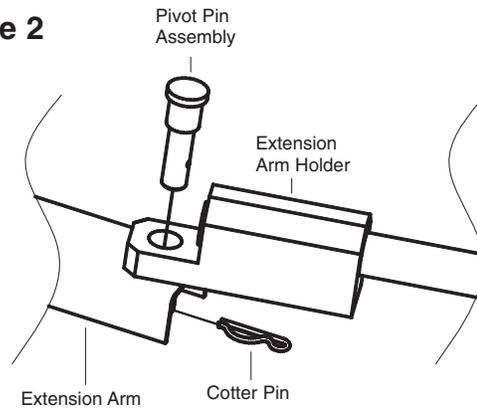


Figure 2



WIRING

⚠️ WARNING

To reduce the risk of SEVERE INJURY or DEATH:

- ANY maintenance to the operator or in the area near the operator **MUST** not be performed until disconnecting the electrical power and locking-out the power via the operator power switch. Upon completion of maintenance the area **MUST** be cleared and secured, at that time the unit may be returned to service.
- Disconnecting power at the fuse box **BEFORE** proceeding. Operator **MUST** be properly grounded and connected in accordance with local electrical codes. **NOTE: The operator should be on a separate fused line of adequate capacity.**
- ALL electrical connections **MUST** be made by a qualified individual.
- **DO NOT** install any wiring or attempt to run the operator without consulting the wiring diagram. We recommend that you Install an optional reversing edge **BEFORE** proceeding with the control station installation.
- ALL power wiring should be on a dedicated circuit and well protected. The location of the power disconnect should be visible and clearly labeled.
- ALL power and control wiring **MUST** be run in separate conduit.
- **BEFORE** installing power wiring or control stations be sure to follow all specifications and warnings described below. Failure to do so may result in SEVERE INJURY to persons and/or damage to operator.

POWER WIRING INSTALLATION

Wiring Specifications (STRANDED COPPER WIRE)

On a Dual Gate System, each unit must be installed on ITS OWN separate circuit.

WIRE GAUGE 6	SINGLE PHASE		THREE PHASE		
	115 Vac	230 Vac	230 Vac	460 Vac	575 Vac
• 1/2 HP Motor -----	425 ft. (129.5 m)	1845 ft. (562.4 m)	2557 ft. (779.4 m)	12789 ft. (3898.1 m)	15987 ft. (4872.8 m)
• 3/4 HP Motor -----	291 ft. (88.7 m)	1107 ft. (337.4 m)	1827 ft. (556.9 m)	6394 ft. (1948.9 m)	10657 ft. (3248.3 m)
• 1 HP Motor-----	213 ft. (64.9 m)	852 ft. (259.7 m)	1278 ft. (389.5 m)	5115 ft. (1559.1 m)	7993 ft. (2436.3 m)

WIRE GAUGE 8	SINGLE PHASE		THREE PHASE		
	115 Vac	230 Vac	230 Vac	460 Vac	575 Vac
• 1/2 HP Motor -----	269 ft. (82 m)	1165 ft. (355.1 m)	1614 ft. (492 m)	8072 ft. (2460.4 m)	10089 ft. (3075.1 m)
• 3/4 HP Motor -----	183 ft. (55.8 m)	699 ft. (213.1 m)	1152 ft. (351.1 m)	4035 ft. (1229.9 m)	6726 ft. (2050.1 m)
• 1 HP Motor-----	134 ft. (40.8 m)	537 ft. (163.7 m)	807 ft. (246 m)	3228 ft. (983.9 m)	5044 ft. (1537.4 m)

WIRE GAUGE 10	SINGLE PHASE		THREE PHASE		
	115 Vac	230 Vac	230 Vac	460 Vac	575 Vac
• 1/2 HP Motor -----	168 ft. (51.2 m)	730 ft. (222.5 m)	1012 ft. (308.5 m)	5064 ft. (1543.5 m)	6330 ft. (1929.4 m)
• 3/4 HP Motor -----	115 ft. (35.1 m)	438 ft. (133.5 m)	723 ft. (220.4 m)	2532 ft. (771.8 m)	4220 ft. (1286.3 m)
• 1 HP Motor-----	84 ft. (25.6 m)	337 ft. (102.7 m)	506 ft. (154.2 m)	2025 ft. (617.2 m)	3165 ft. (964.7 m)

WIRE GAUGE 12	SINGLE PHASE		THREE PHASE		
	115 Vac	230 Vac	230 Vac	460 Vac	575 Vac
• 1/2 HP Motor -----	105 ft. (32 m)	458 ft. (139.6 m)	634 ft. (193.2 m)	3171 ft. (966.5 m)	3964 ft. (1208.2 m)
• 3/4 HP Motor -----	72 ft. (22 m)	274 ft. (83.5 m)	503 ft. (153.3 m)	1585 ft. (483.1 m)	2643 ft. (805.6 m)
• 1 HP Motor-----	53 ft. (16.2 m)	211 ft. (64.3 m)	316 ft. (96.3 m)	1269 ft. (386.8 m)	1982 ft. (604.1 m)

NOTE: Calculated using NEC guidelines. Local codes and conditions must be reviewed for suitability of wire installation. All power wiring should be dedicated and protected. Location of primary power disconnect should be labeled.

WIRING

ON/OFF SWITCH POWER WIRING

NOTE: Before running power wiring refer to wiring specifications on page 14 for correct wire gauges.

Secure all electrical power connections inside the disconnect switch electrical box. Refer to electrical wiring diagrams on pages 30-32.

Important: On three phase operators, power connections must be properly phased. If phased incorrectly, the gate operator will run reversed. To correct this situation, shut off power at main power source and at the operator's electrical disconnect switch. Then reverse any two of the three power leads.

SINGLE PHASE

All single phase operators will have the following:

115V

- L1 (NEUTRAL), WHITE
- L2 (HOT), BLACK
- GROUND, GREEN

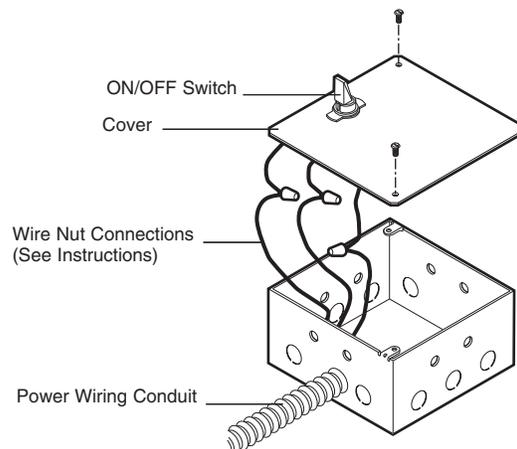
208/230V

- L1 (HOT), BLACK
- L2 (HOT), BLACK
- GROUND, GREEN

THREE PHASE

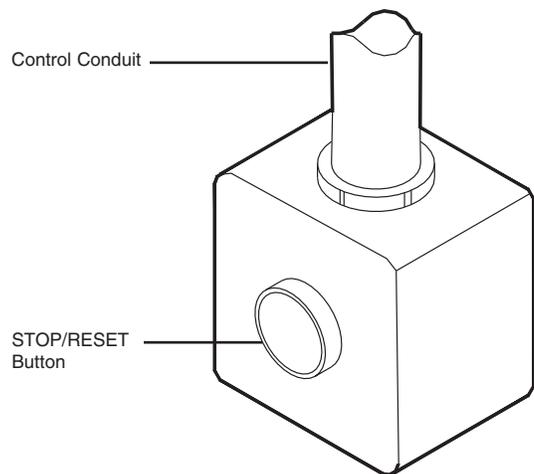
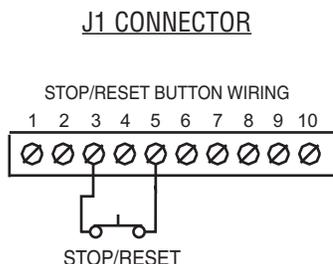
All three phase operators will have the following:

- L1 BLACK
- L2 BLACK
- L3 BLACK
- GROUND, GREEN



STOP/RESET BUTTON CONTROL WIRING (REQUIRED)

1. This control will function as a Stop/Reset command and is to be wired within line of sight of the gate. **The operator will not function unless this circuit is completed.**
2. Wire control station to terminals 3 and 5 in the control box on the operator.



NOTE: For additional control station options refer to pages 20 and 21.

ADJUSTMENT

PROGRAMMING THE RADIO RECEIVER

SET SECURITY MODE

The Universal Receiver can be used with up to 15 315 MHz rolling code remote controls or PINs in HIGH security mode. Alternately, it can be used with up to 31 of any type 315 MHz remote control in NORMAL security mode, including any combination of rolling code, billion code, or dip switch remotes.

The jumper must be set at the HIGH position for the receiver to operate in HIGH security mode. It must be set at NORMAL position to operate at the NORMAL mode (Figure 1).

When changing from NORMAL to HIGH security mode, any previous remote control codes must be erased. Repeat Steps 2 and 3 in the Programming Section below to reprogram the receiver for each remote control in use.

The receiver is factory set at HIGH.

⚠ WARNING

To prevent possible serious injury or death, the use of **CONSTANT OPERATION** on residential openers is **PROHIBITED**.

SET OUTPUT DURATION

For commercial applications, the receiver can be set for either constant or momentary closure on the output contacts. Use of constant closure is prohibited on residential garage door openers because it overrides the safety reversal devices.

With the jumper in the "M" (Momentary) position, the contacts will close for 1/4 second regardless of the length of radio transmission. With the jumper in "C" (Constant) position, the contacts will stay closed as long as the radio continues transmitting (Figure 2).

The receiver is factory set at M.

PROGRAMMING THE REMOTE TO THE RECEIVER

1. Pry open the front panel of receiver case with a coin or a screwdriver. Re-connect power to opener (Figure 3).
2. Press and release the "learn" button on the receiver. The learn indicator light will glow steadily for 30 seconds.
3. Within 30 seconds, press and hold the button on the hand-held remote that you wish to operate your garage door.

The opener will now operate when the push button on either the receiver or the remote control is pressed.

Repeat Steps 2 and 3 for each remote control that will be used to operate the garage door opener.

To erase all remote control codes

Press and hold the "learn" button on the receiver panel until the indicator light turns off (about 6 seconds). All remote control codes are now erased. Then follow the steps above to reprogram each remote control.

⚠ WARNING

To prevent possible **SERIOUS INJURY** or **DEATH** from electrocution:

- Be sure power is not connected **BEFORE** installing the receiver.

To prevent possible **SERIOUS INJURY** or **DEATH** from a moving gate or garage door:

- **ALWAYS** keep remote controls out of reach of children. **NEVER** permit children to operate, or play with remote control transmitters.
- Activate gate or door **ONLY** when it can be seen clearly, is properly adjusted, and there are no obstructions to door travel.
- **ALWAYS** keep gate or garage door in sight until completely closed. **NEVER** permit anyone to cross path of moving gate or door.

NOTICE: To comply with FCC and/or Industry Canada (IC) rules, adjustment or modifications of this receiver and/or transmitter are prohibited, except for changing the code setting or replacing the battery. **THERE ARE NO OTHER USER SERVICEABLE PARTS.**

Tested to Comply with FCC Standards FOR HOME OR OFFICE USE. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Figure 1

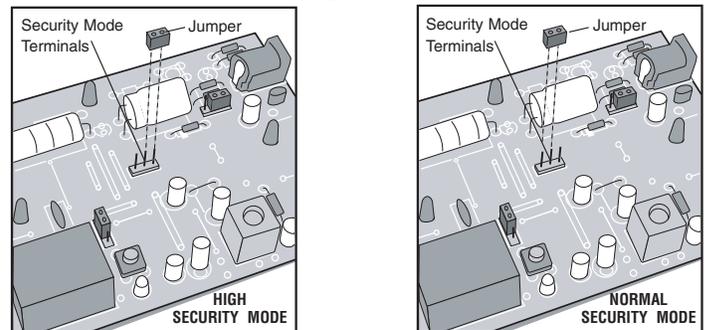


Figure 2

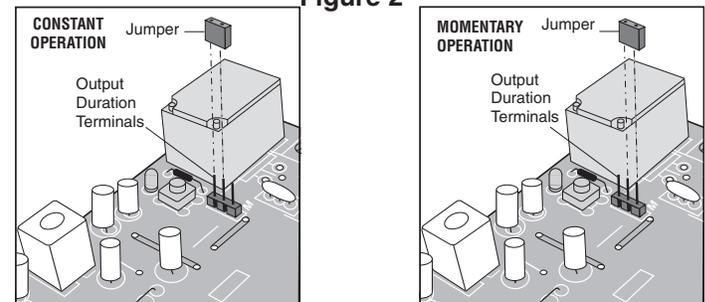
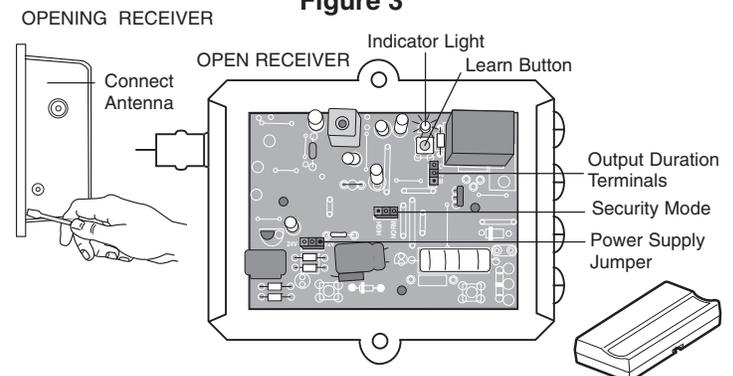


Figure 3



ADJUSTMENT

LIMIT SWITCH ADJUSTMENT

NOTE: For limit location and configuration refer to Figure 1

1. Before turning on power, disconnect extension arm from gate bracket so gate is no longer connected to operator. Push manual release pin(s) up through the control arm, slide clevis pin in place and secure with a cotter pin.
2. The (3) collars are held to shaft by set screws. The collars should now be loose on the shaft. If not, loosen all set screws until collars are moving freely on shaft.

TO ADJUST CLOSE LIMIT SWITCH

3. Turn on electrical power.
4. Press CLOSE button (if installed) or connect terminals 4 & 5 on J1 terminal strip to cause the gate to close. The control arm should move in the close direction.
5. When control arm is pointed in approximate direction of gate bracket (on fully closed gate) press STOP button or release terminals to stop control arm.

NOTE: If control arm does not move far enough to point in proper direction, the close limit switch has been prematurely actuated. Turn off power, loosen set screw on close limit cam and rotate nut away from close limit switch. Repeat steps 3 and 4 until control arm is pointed in correct direction.

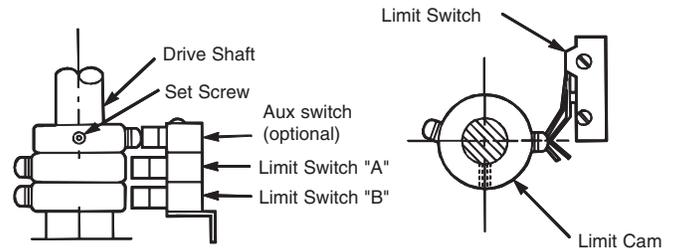
6. Turn off power. Be sure close limit cam is freely turning. Rotate cam in close direction. Stop when cam just clicks close limit switch. Tighten set screw.
7. Reconnect gate bracket to extension arm. If arm has moved too far in close direction to allow connection of gate bracket turn off power, connect terminals 5 & 7 to rotate arm in opposite direction, and press STOP button when arm is in desired position.

TO ADJUST OPEN LIMIT SWITCH

8. Turn on power. Press OPEN button (if installed) or connect terminals 5 & 7 on J1 terminal strip. Gate should open. If gate does not open the open limit cam may be already actuating open limit switch or an improper electrical connection may have been made. Turn off power, inspect, correct and repeat this step.
9. When gate reaches desired fully open position press STOP button or release terminals. Turn off power. Limit cam should turn freely. Rotate cam in open direction. Stop when cam just clicks the open limit switch. Tighten set screw.
10. Fine tune both switch settings by using J1 terminals 4 & 5 (to CLOSE) of 5 & 7 (to OPEN) and the factory supplied STOP button to move gate and rotating limit collars slightly to alter gate travel. Rotate cam away from limit switch to increase travel, toward switch to decrease travel.

CAUTION

When following limit switch adjustment procedure, the motor belt will turn and the control arm will move during some steps. Keep hands and tools out of operator and away from arm and drive shaft unless power is off or serious injury may occur.



LIMIT DIRECTION		
DIRECTION OF GATE TO OPEN	OPEN LIMIT	CLOSE LIMIT
RIGHT (Factory Default)	A	B
LEFT	B	A

ADJUSTMENT

RPM SENSOR (HALL EFFECT) ADJUSTMENT

NOTE: Normally the RPM sensor (hall effect) does not need adjustment, but may go out of alignment due to shipping vibration or rough handling.

These operators use an internal entrapment protector system. This system consists of the control board, magnet, and RPM sensor. It may become necessary to adjust the sensor for correct alignment. To do so, please perform the following steps:

1. Loosen the two screws holding the hall bracket to the frame.
2. Adjust the bracket so that the sensor is:
 - a. Parallel with the pulley.
 - b. .020" (.051 cm) away from the pulley's magnet. Use a feeler gauge to measure the distance.
3. Tighten screws to secure assembly.
4. Manually rotate pulley to ensure that each magnet clears the sensor board.

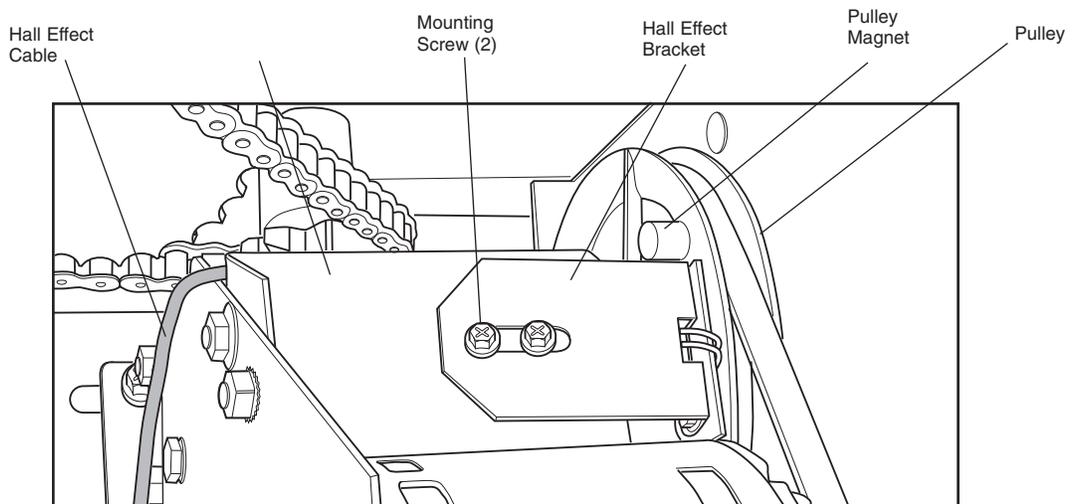
If a magnet does not clear the board, re-adjust the RPM (hall effect) assembly accordingly.

WARNING

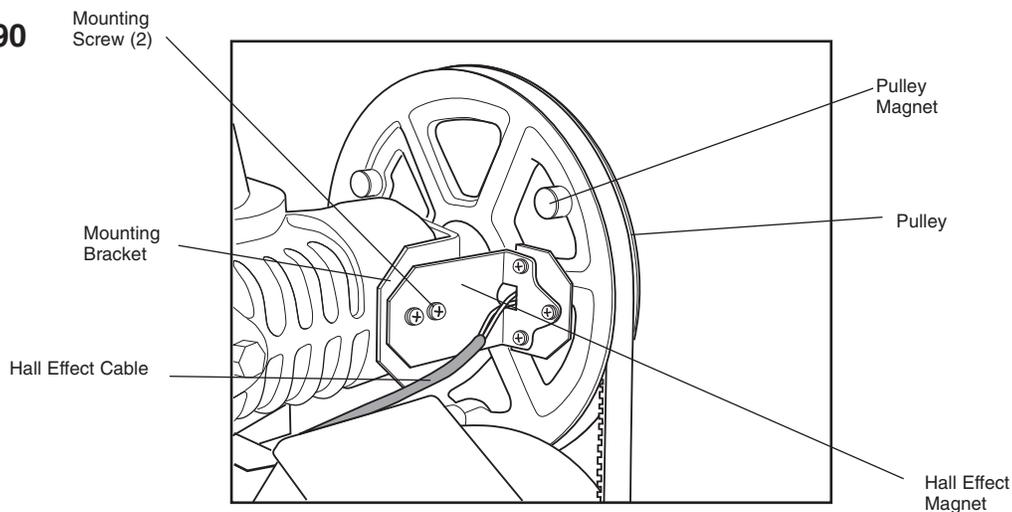
To reduce the risk of SEVERE INJURY or DEATH:

- Disconnect power BEFORE performing ANY adjustments.

MODEL SW470



MODEL SW490



ADJUSTMENT

SEQUENCED ACCESS MANAGEMENT SYSTEM (SAMS)

The Sequenced Access Management System or SAMS allows the customer more control when managing vehicular entrances to areas such as apartment complexes, businesses and gated communities. The basic concept of the system is that traffic is controlled by two gates installed in tandem, a fast moving gate such as a barrier gate operator and a slower moving more secure or ornamental gate such as a single or pair of slide/swing gate operator. The design of this gate system balances the demands of speed during high traffic periods with security during low traffic periods. Barrier gates typically have the fastest open times of the many gate operator types and the slide or swing gates allow you to effectively seal off the perimeter of the complex you are planning to secure.

NOTE: Connect all entry devices to the slide or swing gate. If using a device, such as a 7-day timer, to latch the slide or swing gate open during high traffic times, connect the device's N/O relay output to the control board's Interrupt Loop input. Once the device activates the Interrupt Loop input, the next vehicle to access the SAMS system will lock the gate in the open position until the device deactivates. When the device deactivates, the timer to close will automatically close and secure the gate.

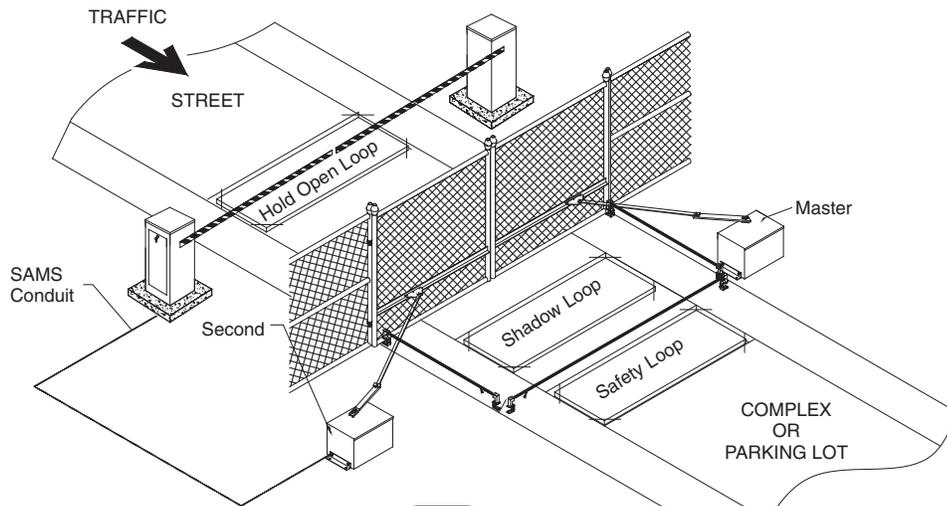
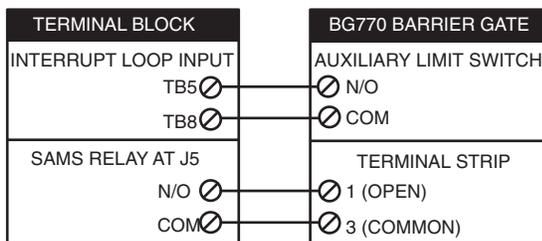
SAMS OPERATION

1. When an authorized vehicle accesses the gate system, the SAM system responds by first opening the gate farthest from the vehicle, the swing or slide gate.
2. Once the swing or slide gate is open, the barrier gate begins its open cycle.

3. Once the barrier is open the vehicle may pass through the SAM system. At this point you have two options in how you would like to initiate the SAM systems closure. You may chose to:
 - a. Use a timer to close system to automatically close the barrier gate after a preset amount of time or
 - b. Use a loop system to close the barrier gate after the vehicle has passed through the SAM system.
4. Once the barrier gate is closed the slide or swing gate will activate its internal timer to close and begin closing.
5. If another authorized vehicle accesses the SAM system before the slide or swing begins to close the barrier will open and allow the vehicle to pass through the SAM system.
6. If another authorized vehicle accesses the SAM system during the slide or swing gates closing cycle the SAM system will reopen the slide or swing gate. Once the slide or swing gate reaches the open position the barrier will then open to allow the vehicle to pass through the SAM system.
7. If no other authorized vehicles access the SAM system the swing or slide gate will close followed by the barrier.

SAMS WIRING

1. Install conduit between the BG770 and the SW420 for SAMS control wiring.
2. Run a 4-conductor cable in the conduit between the BG770 SW420.
3. Locate the SAMS relay terminals (J5) on the control board in the SW420 and locate the auxiliary limit switch in the BG770.
4. Attach a wire from the SAMS relay terminal (J5) on the control board to terminal 1 on the BG770 terminal strip.
5. Attach a wire from the SAMS relay terminal (J5) on the control board to terminal 3 on the BG770 barrier gates terminal strip.
6. Attach a wire from terminal J1-5 on the control board to the common (COM) on the auxiliary limit switch in the barrier gate.
7. Attach a wire from terminal J1-8 on the control board to the normally open (NO) on the auxiliary limit switch.
8. Test for correct functionality of the SAM system.



ADJUSTMENT

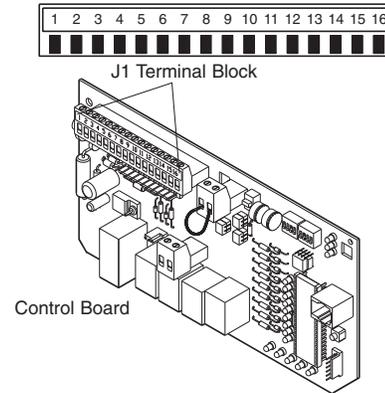
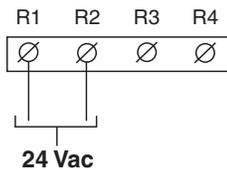
ACCESSORY WIRING

All inputs are normally open and momentary, except the stop (N.C.). The following instructions are based upon UL325, and include recommendations for significant increase in safety.

We strongly recommend that you follow the UL guidelines presented throughout the manual. Refer to instructions shipped with optional control devices for mounting, wiring, programming and adjustment.

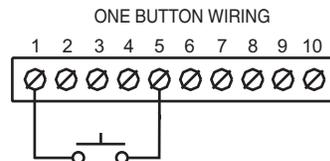
24Vac Accessory Power

Can be found at terminals R1 and R2 located on radio terminal block.



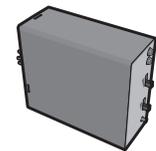
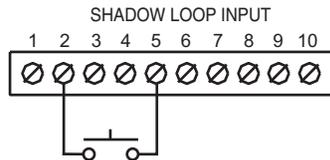
J1 Terminals 1 & 5 - Residential Radio (single button) Input

These terminals are intended for use with a radio receiver in a residential application or as a single button control. This allows the user to open the gate by activating the remote control when the gate is closed or between limits. This input also gives the user the ability to close the gate by activating the remote control when the gate is on the open limit.



J1 Terminals 2 & 5 - Shadow Loop Input

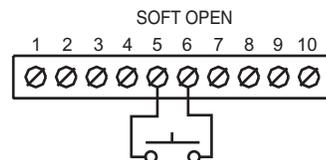
These terminals are intended for use with a loop detector and is primarily used on swing gate operators. This input protects cars by preventing the gate from moving off of the **open or close limit** when the shadow loop input is active.



J1 Terminals 6 & 5 - Soft Open

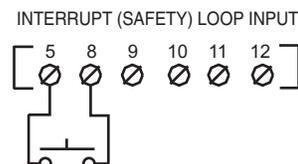
These terminals are intended for use as a general open control. Accessories that may be wired to this input include: Telephone Entry Systems, Radio Receiver (Commercial Applications), Exit Loop Detector, Keypads, 7-Day Timer.

NOTE: Will not override a double entrapment (signalled by the gate stopped and entrapment alarm on).



Field Wiring Terminals 8 & 5 - Interrupt (Safety) Loop Input

These terminals are intended for use with a loop detector. This input functions to reverse a closing gate to the open limit. Latching this input will reset the timer to close.



ADJUSTMENT

ACCESSORY WIRING

Field Wiring Terminals 9 & 5 - Obstruction Open (Edge/ Photo Eye Input)

Edge Input: See Programming Section

This input will reverse an opening gate to the close limit.

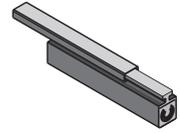
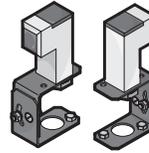
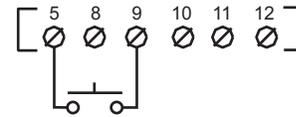
Activating this input when the gate is closing will have no effect.

NOTE: If upon reversal a second separate obstruction is detected (gate edge or RPM sensor), gate will stop and alarm.

Photo Eye Input: See Programming Section

This input will pause an opening gate. Once the input (photo eye) is cleared, the gate continues to open. Activating this input when the gate is closing will have no effect.

OBSTRUCTION OPEN (EDGE/PHOTO EYE INPUT)



Field Wiring Terminals 10 & 5 - Obstruction Close (Edge/ Photo Eye Input)

Edge Input: See Programming Section

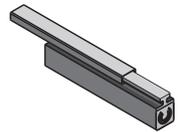
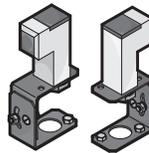
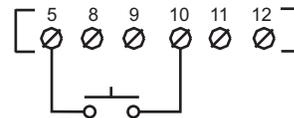
This input will reverse a closing gate to the open limit. When

reaching the open limit the timer to close, if enabled, will be disabled until another command is given. Activating this input when the gate is closing will have no effect. **NOTE:** If upon reversal a second separate obstruction is detected (gate edge or RPM sensor), gate will stop and alarm.

Photo Eye Input: See Programming Section

This input will reverse a closing gate to the open limit. This input will not affect the timer to close. Activating this input when the gate is closing will have no effect.

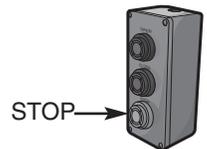
OBSTRUCTION CLOSE (EDGE/PHOTO EYE INPUT)



Field Wiring Terminals 3 & 5 - Stop/Reset Control Input

These terminals are intended for use with a single stop/reset button or the stop control of a three-button station that is installed within line of site of the gate. This input functions to stop the gate or to reset the gate after an entrapment fault. **NOTE:** This input uses a normally closed circuit and the operator will not run until a stop control is installed.

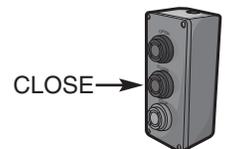
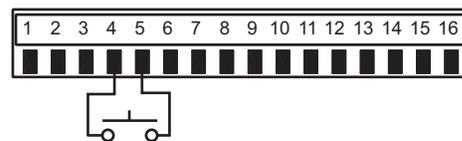
STOP/RESET BUTTON WIRING



J1 Terminals 4 & 5 - Hard Close Control Input

These terminals are intended for use only with the close control of a three-button station that is installed within line of sight of the gate. A momentary activation of this input will cause the gate to close. **Activation of this input for longer than three seconds will enable the control to be used as a constant pressure override device.** This will allow the user, in emergencies, to override a failed accessory such as a loop detector or photo-eye.

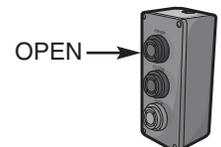
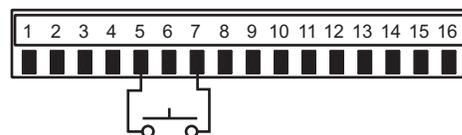
HARD CLOSE CONTROL INPUT



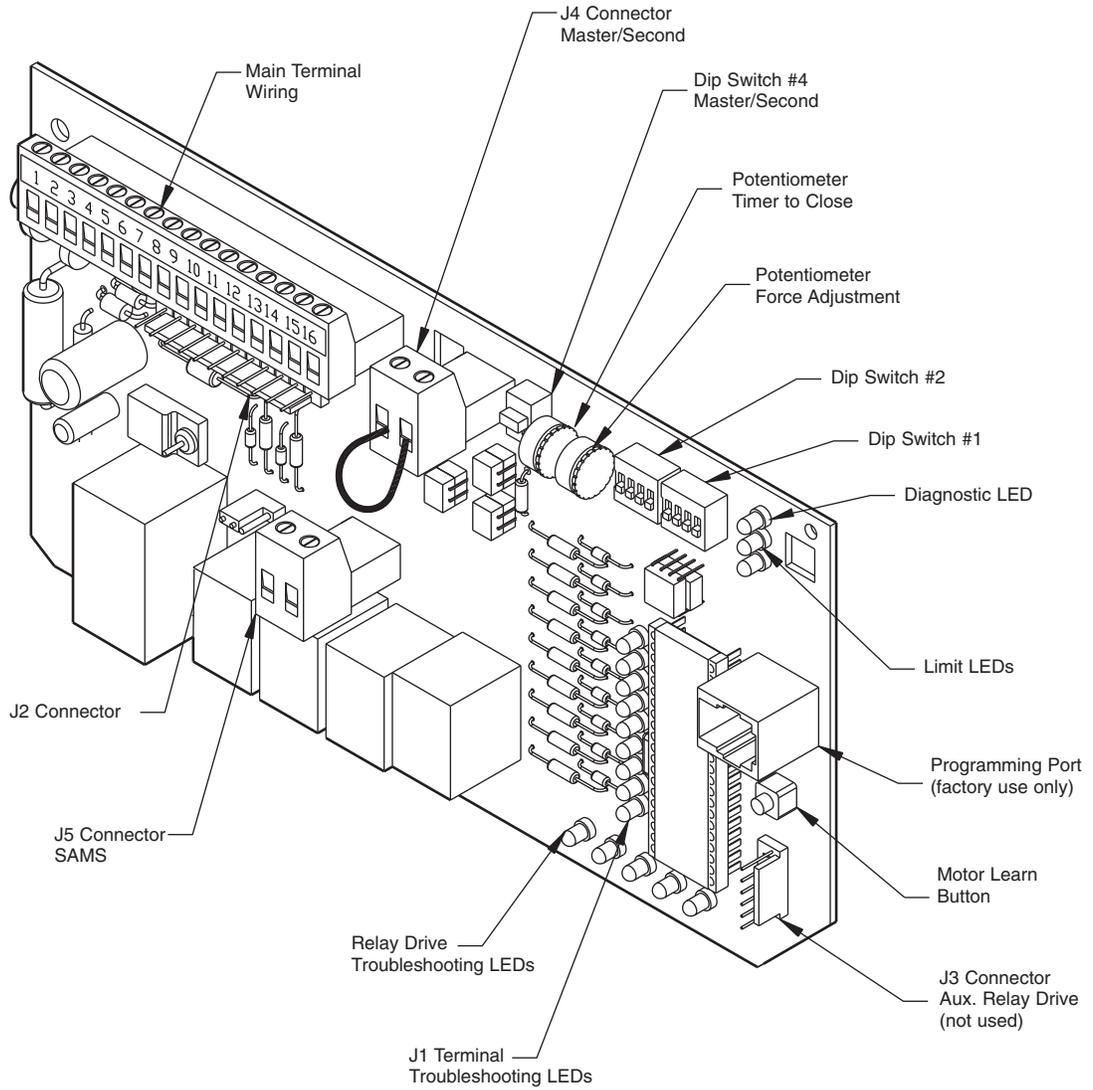
J1 Terminals 7 & 5 - Hard Open Control Input

These terminals are intended for use only with the open control of a three-button station that is installed within line of sight of the gate. A momentary activation of this input will cause the gate to open. **Activation of this input for longer than three seconds will enable the control to be used as a constant pressure override device.** This will allow the user, in emergencies, to override a failed accessory such as a loop detector or photo-eye.

HARD OPEN CONTROL INPUT



CONTROL BOARD ILLUSTRATION



ADJUSTMENT

CONTROL BOARD PROGRAMMING AND FEATURES

MOTOR LEARN FUNCTION (FORCE PROFILE)

This function is preprogrammed at factory. If either board or motor is replaced, the controller will need to be programmed to "LEARN" the specific motor RPM profile of your operator. Switch "S3" is provided for this. This is important for accurate force control. Failure to do so may result in improper and unsafe operation.

To learn the motor:

NOTE: Motor Learn must be performed in stand alone mode.

1. The operator must remain attached to the gate throughout the entire process.
2. Press the motor learn button. The yellow LED should start to flash rapidly.
3. Install a jumper on either the hard open or the hard close input terminals. The motor will run for a few seconds and then stop. If the LED goes out the motor is learned. If the unit activates a limit before completing the learn or some other error occurs, the LED will go back to on continuously. If this happens, try learning while running in the opposite direction.

NOTE: It is important that the jumper is in constant contact while the gate is moving in learn mode.

FORCE CONTROL

Set the force control pot such that the unit will complete a full cycle of gate travel but can be reversed off an obstruction without applying an unreasonable amount of force. On most operators this will be around the middle of the range.

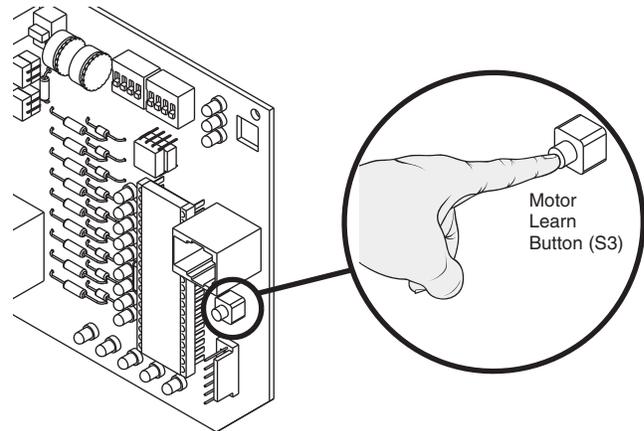
NOTE: For LED location refer to illustration on previous page.

DIAGNOSTICS (LEDS AND CODES)

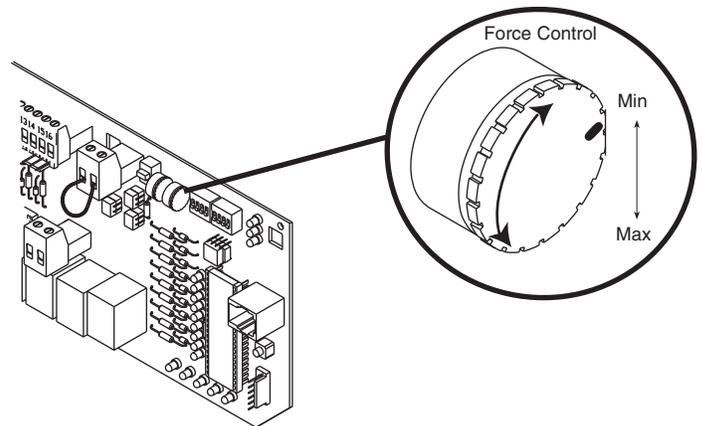
There are three diagnostic LEDs. Two red LEDs (OLS, CLS) are indicators for the open and close limits. The LEDs are illuminated when the limit switch contacts are closed.

The third amber LED (DIAG) is used to blink out diagnostic codes. The number is the count of the number of times the LED is on in an 8 second period. The LED is on for approximately 1/2 second and repeats every second until the number is reached. There will be a pause following each pulse cycle (1-6 pulses) to differentiate between the different diagnostic codes.

MOTOR LEARN BUTTON



FORCE CONTROL



LED Code Flashed	Diagnostic Meaning	Cleared By
OFF	Normal operation	N/A
1	Single entrapment sensed	Control Input
2	Double entrapment	Hard Input*
3	Failed or no hall effect sensor	Removal of problem
4	Exceed maximum motor run time	Hard Input*
5	Limit fault	Control Input
6	Loss of communications between master and second during run mode	Removal of problem
On No Flash	Motor not learned	Completion of Motor Learn Routine

*Hard inputs include open override, close override and stop inputs.

ADJUSTMENT

CONTROL BOARD PROGRAMMING AND FEATURES (CONTINUED)

RELAY DRIVE TROUBLESHOOTING LEDS

There are 5 troubleshooting LEDs on relay drives K1 through K5. These LEDs will be illuminated when the microcontroller relay drive is activated.

LED	LED NAME	DESCRIPTION
D6	Contactor A	On when Contactor A is activated
D5	Contactor B	On when Contactor B is activated
D4	SAM	On when SAM relay is activated
D3	Lock	On when Mag Lock relay is activated
D2	Alarm	On when Alarm Relay is activated

TROUBLESHOOTING LEDS

There are 9 troubleshooting LEDs.

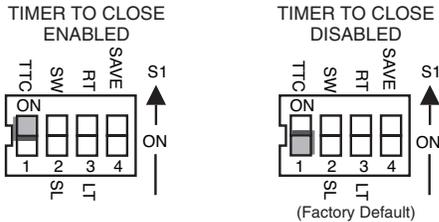
LED	LED NAME	DESCRIPTION
D11	Radio	On when Radio switch is activated
D13	Shadow	On when Shadow Loop is activated
D15	Hard Close	On when Close switch is activated
D17 (Green)	Stop	On when Stop switch is not activated
D19	Soft Open	On when Open switch is activated
D21	Hard Open	On when Open switch is activated
D24	Interrupt (Safety) Loop	On when Interrupt/Safety Loop activated
D29	Obstruction Open	On when Edge is activated or when Photo Eye Beam is broken
D31	Obstruction Close	On when Edge is activated or when Photo Eye Beam is broken

PROGRAM SETTINGS (DIP SWITCH S1)

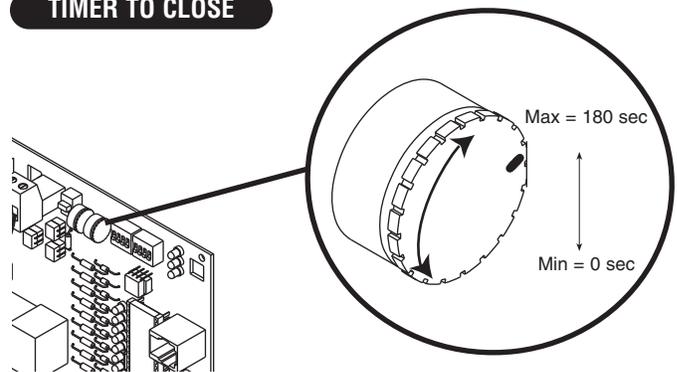
NOTE: For all S1, S2 and S4 switch settings to take effect, the Save Mode switch must be set to the off position.

TIMER TO CLOSE ENABLE

This switch enables the auto close timer. The timer to close feature works in conjunction with the potentiometer located on the board.



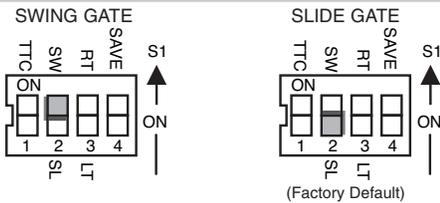
TIMER TO CLOSE



SLIDE/SWING

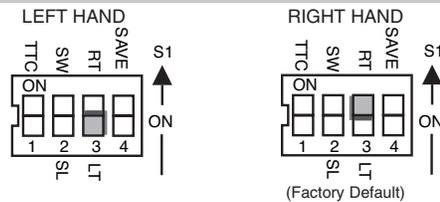
This switch selects slide or swing gate operation, in order to optimize gate behavior for specific application.

SL = Slide • SW = Swing



RIGHT/LEFT OPERATION

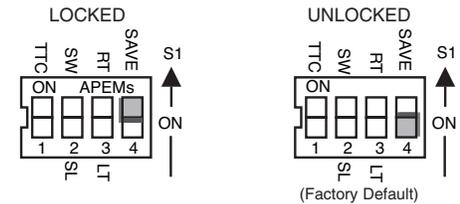
This switch selects the gate opening direction, to the left or to the right. Right/Left operation is determined from the inside of fence looking out.



“SAVE” SWITCH

This switch stores all settings into memory and locks out changes.

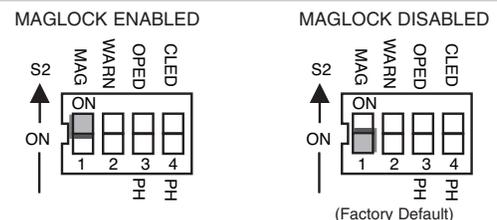
NOTE: For any programming changes to take effect this switch must be in OFF position. When switch is ON, no settings can be changed.



PROGRAM SETTINGS (DIP SWITCH S2)

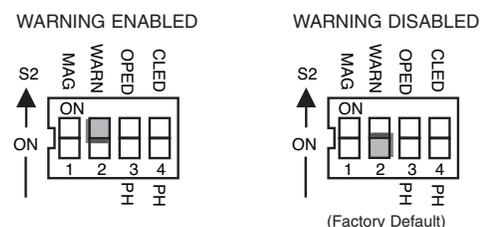
MAGLOCK ENABLE

This switch enables the Maglock feature. On an open command there will be a half second delay after the maglock relay is released before the motor starts.



WARNING ENABLE

This switch enables the gate “in motion” alarm feature. The alarm will beep 3 seconds prior to movement and throughout movement.



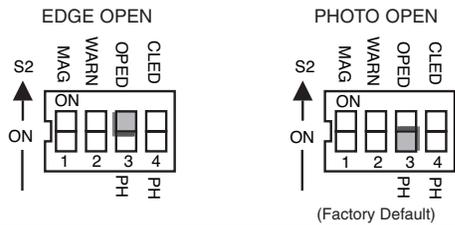
PROGRAM SETTINGS (DIP SWITCH S2)

EDGE/PHOTO OPEN

This switch (S2-3) selects edge or photo sensor for the gate opening protection input.

Open Photo Eye (Pause): When the controller is configured for photo eyes, the input functions to pause the gate during the opening cycle. Once the input is cleared the gate continues to open.

Open Edge: When the controller is configured for safety edges, the input functions to reverse the gate to the close limit when the edge is activated during the opening cycle.



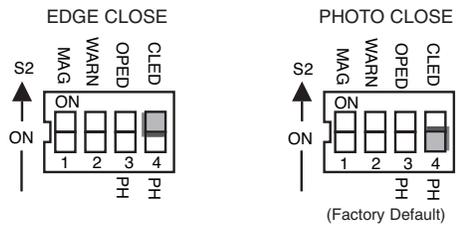
EDGE/PHOTO CLOSE

This switch (S2-4) selects edge or photo sensor for the gate closing protection input.

Close Photo Eye (Reverse): When the controller is configured for photo eyes, the input functions to reverse the gate to the open limit when activated during the close cycle.

NOTE: Timer to close will reset if enabled.

Close Edge: When the controller is configured for safety edges, the input functions to reverse the gate to the open limit when activated during the close cycle. The entrapment is not cleared at the limit and the timer to close will be disabled. The timer to close may be enabled by activating the interrupt loop, soft open or hard open input.



MASTER/SECOND SYSTEMS

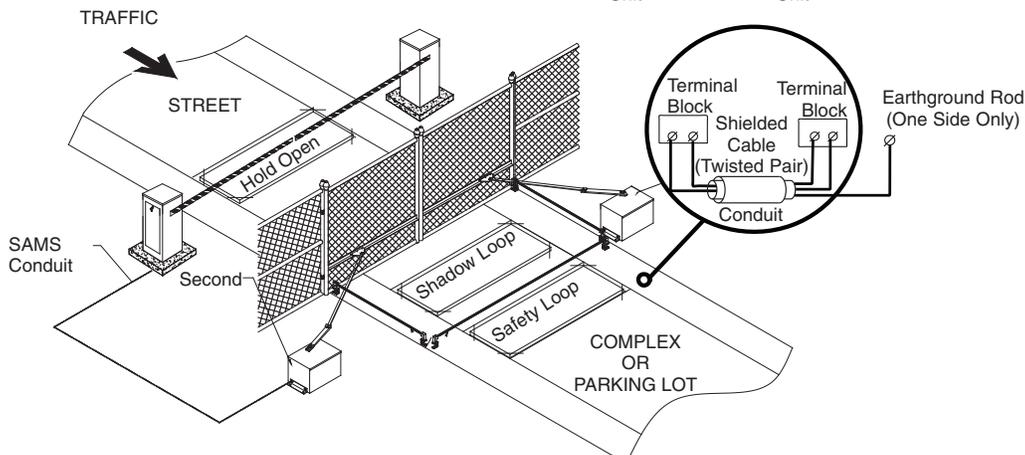
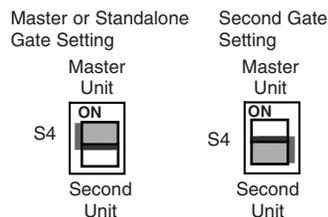
Dual Gate Communications

The control board is capable of running the operator in a master or second mode depending on (S4) switch setting.

Before initiating any command the master unit queries for the presence of a "second unit" for a time period of one second. If the master gets no response the operator will operate in a stand alone mode. **NOTE: For single unit applications, a jumper must be placed between 11 and 12 of the field wiring terminal block. In this mode no further communications will take place during travel. If the master detects the presence of a second unit the master will continue to query the second unit during travel. The second unit will send a response to the master for every query. The second operator will stop if there is a period of one second or more of no communications.**

When two operators are connected in dual gate configuration accessories may be connected to either the master or second.

NOTE: Do not run Master/Second communication wiring in the same conduit as the power and control wiring. The Second unit will require a normally close stop circuit for proper system operation. After Master/Second wiring has been completed and the S4 switch programmed, both units must have their power cycled to initiate proper Master/Second communication. The motor learn function must be completed in stand alone mode prior to Master/Second wiring.



TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSES	SOLUTION
Operator fails to run.	No Stop Control.	Check the green LED (D17) on control board. If the green LED is off, check to make sure a stop control has been installed across terminals J1-3 & J1-5 of the control board.
	Fault in the operator. Check the yellow diagnostic LED at the top right of the control board next to the programming dip switches.	If the yellow LED blinks six times there is a master/second unit communication failure. If operator is a single unit make sure there is a jumper across terminals 11 and 12. If operator is in a dual gate configuration make sure that the communication wiring between the two units is undamaged and complete.
		If the yellow light is solid the board needs to learn the motor. Follow the directions on page 23.
	An accessory is active or malfunctioning. Check the red input status LEDs, D11-D31.	If any red LEDs are on, check the corresponding input. An installed accessory may be wired incorrectly or malfunctioning. Remove the accessory and test the operator.
	Improper J4 Connector Wiring (Master/Second).	Stand-alone Operators: make sure there is a jumper installed across the J4 connector.
		Master/Second Operation: Make sure that the master/second wiring is installed correctly and is intact (not damaged).
	Low or no high voltage power.	Measure the incoming voltage at the unit's on/off switch. It should be within 5% of the operator's rating when running. Make sure that the proper wire gauge was used for the distance between breaker and operator by consulting the wiring specifications section on page 14 of this manual.
	Low or no low voltage power.	Measure the voltage at terminals R1 & R2 in the operator. This voltage should be within 5% of 24Vac. If the high voltage power is good and the low voltage power is bad, check transformer wiring and replace transformer.
No LEDs illuminated on the control board.	If both primary and secondary power is good, check to make sure that the J2 connector is making good contact with the pins on the board. If all is good, replace the control board.	
The relays chatter when the operator begins to move.	Low secondary (low voltage) power.	Measure the voltage at terminals R1 & R2 in the operator. This voltage should be within 5% of 24Vac. If the high voltage power is good and the low voltage power is bad, check to make sure the circuit breaker is not tripped and that the correct primary tap is used on the transformer. If breaker and tap are correct replace the transformer.
The operator runs slow and/or trips the internal overload.	Low primary (high voltage) power.	Measure the incoming line voltage at the unit's on/off switch as well as the meter base or sub panel. Make sure there is not a major change in voltage. The voltage at the operator should be within 5% of the operator's rating when running.
		Check the number of amps currently being drawn from the panel, make sure that the total power being drawn does not exceed the panel's rating.
		Make sure that the proper wire gauge was used for the distance between breaker and operator by consulting the wiring specifications section on page 14 of this manual.
	Problem in the motor.	Perform a visual inspection of the motor. Examine the motor's labels for any distortion or signs of over heating. Replace the motor if it is humming, grinding or making excessive noise. NOTE: Repeated motor problems indicate poor primary power.
Motor runs but gate does not move.	Damaged or improperly tensioned belt/drive chain.	Make sure that the operator's belt/drive chain is intact and tensioned correctly.

TROUBLESHOOTING continued

SYMPTOM	POSSIBLE CAUSES	SOLUTION
Master or Second operator is not functioning properly.	Failure to cycle power after setup.	The power to each unit must be cycled in order to initiate proper master/second communication if the operators were previously in stand-alone mode.
	The communication wiring may be damaged or improperly wired for dual gate operation.	Make sure that the communication wire that is used is twisted pair and not run in the same conduit with any power wiring. Failure to do so will result in interference across the master/second communication line.
	The master or second unit is not programmed correctly.	Review program settings pages 25-26 and check both the master and second for proper programming.
Operator runs but then stops and reverses direction.	Entrapment (Force Pot) incorrectly set.	This pot must be set so that the gate will run smoothly normally and reverse when encountering an obstruction. See page 23.
	Gate is binding or not running smoothly.	Disconnect the gate from the operator and swing the gate open and close by hand at normal operating speed. Make sure that the gate swings smoothly and does not bind. If the gate is hard to move or binds repair the gate.
	Observe red LEDs D29 and D31.	Both LEDs will indicate the activation of entrapment protection devices on terminals J1-9 & J1-10 on the control board. Remove the devices and retest. If the operator now runs without fault, check those accessories as well as their wiring.
	The Hall Effect Sensor is not aligned/adjusted correctly.	Make sure that the sensor is adjusted so that it is within 20 thousandths of an inch or as close to the magnets located on the gearbox pulley as possible without coming into contact with them or the pulley. Replace the sensor if it is adjusted correctly but continues to fail.
The operator opens immediately upon power up and does not close.	Check the red input status LEDs, D11-D31, for indication of an active or malfunctioning accessory.	If any red LEDs are on, check the corresponding input. An installed accessory may be wired incorrectly or malfunctioning. Remove the accessory and test the operator.
Programming changes do not effect the gate.	Check the save switch on switch S1-1.	If the switch S1-1 is in the on position any subsequent programming changes will not affect the gate. To make programming changes, switch S1-1 off, make desired changes, and then switch S1-1 on.
Open photo eye reverses gate closed when activated during opening.	Open obstruction input is programmed incorrectly.	The open obstruction input has been programmed to function with gate edges not photo eyes. Refer to page 26 and reprogram the obstruction inputs for correct operation.
Gate does not activate the timer to close after the close photo eye is broken.	Close obstruction input is programmed incorrectly.	The close obstruction input has been programmed to function with gate edges not photo eyes. Refer to page 26 and reprogram the obstruction inputs to match the accessories that are installed on the operator.
Radio controls will close gate from the open limit.	Radio terminals R1-4 are factory configured for residential (Open and Close) radio function.	Configure terminals R1-4 for residential radio function by performing the following modifications: 1. Locate and disconnect the end of the wire running to terminal J1-1 from R4. 2. Connect the end of wire removed from J1-1 to J1-6. Refer to page 33.

OPERATOR MAINTENANCE

IMPORTANT SAFETY INSTRUCTIONS

WARNING

To reduce the risk of SEVERE INJURY or DEATH:

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. NEVER let children operate or play with gate controls. Keep the remote control away from children.
3. ALWAYS keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.
4. Test the gate operator monthly. The gate MUST reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of INJURY or DEATH.
5. Use the emergency release ONLY when the gate is not moving.
6. KEEP GATES PROPERLY MAINTAINED. Read the owner's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles ONLY. Pedestrians MUST use separate entrance.
8. Disconnect ALL power BEFORE performing ANY maintenance.
9. ALL maintenance MUST be performed by a LiftMaster professional.
10. **SAVE THESE INSTRUCTIONS.**

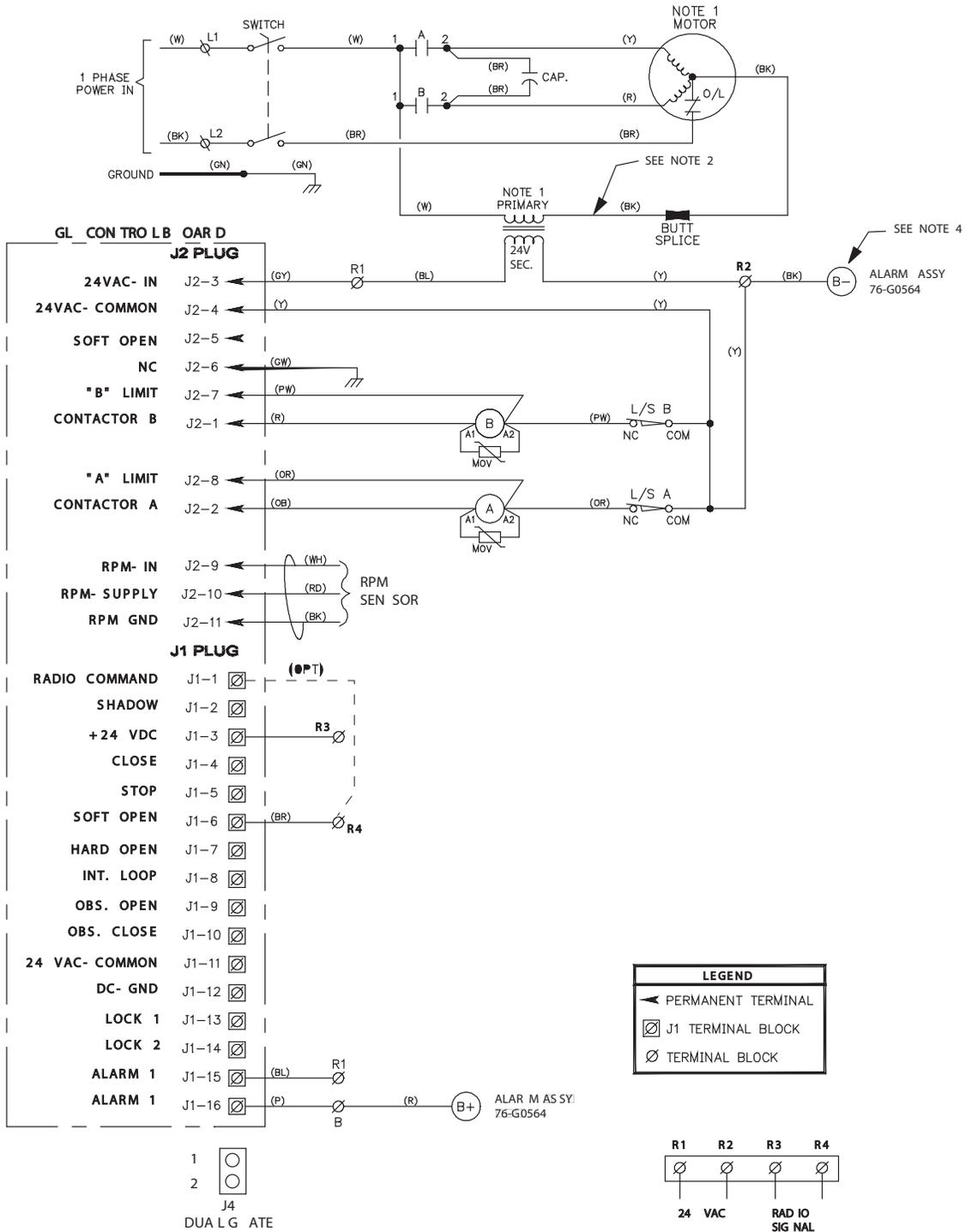
CHECK AT LEAST ONCE EVERY

DESCRIPTION	TASK	CHECK AT LEAST ONCE EVERY		
		3 MONTHS	6 MONTHS	12 MONTHS
RPM Sensor (Hall Effect)	Check for proper adjustment	X		X
External Entrapment Protection Systems	Check for proper operation	X		X
Gate Caution Signs	Make sure they are present	X		X
Manual Disconnect	Check and operate		X	X
Drive Chain	Check for excessive slack and lubricate		X	X
Sprockets and Pulleys	Check for excessive slack and lubricate		X	X
Gate	Inspect for wear or damage		X	X
Accessories	Check all for proper operation		X	X
Electrical	Inspect all wire connections		X	X
Frame Bolts	Check for tightness		X	X
Total Unit	Inspect for wear or damage		X	X

NOTES

1. Severe or high cycle usage will require more frequent maintenance checks.
2. Inspection and service should always be performed anytime a malfunction is observed or suspected.
3. Limit switches may have to be reset after any major drive chain adjustments.
4. If lubricating chain, use only a proper chain lube spray or a lightweight motor oil. Never use grease or silicone spray.
5. When servicing, please do some "house cleaning" of the operator and the area around the operator. Pick up any debris in the area. Clean the operator as needed.
6. It is suggested that while at the site voltage readings be taken at the operator. Using a Digital Voltmeter, verify that the incoming voltage to the operator it is within ten percent of the operators rating.

SINGLE PHASE WIRING DIAGRAM (SW470)



NOTES:

- 1) TRANSFORMER PRIMARY VOLTAGE SAME AS OPERATOR LINE VOLTAGE 24V SECONDARY 60VA.
- 2) TERMINAL DESIGNATIONS SHOWN FOR 115V ONLY.
- 3) OPTIONAL WIRE HARNESS.
- 4) (B+) AND (B-) ARE 100dB SAFETY ALARMS.

APPLICATIONS:

CONTROL WIRING TYPE - GL

FIELD WIRING & ADJUSTMENTS

MODEL TYPES: SW470 (MSW)
 HORSEPOWER: 1/2
 VOLTAGE/PHASE: 115V & 230V, 50/60Hz - 1 PHASE ONLY

DRAWING NUMBER:

01-G1978

DATE: 7/29/03

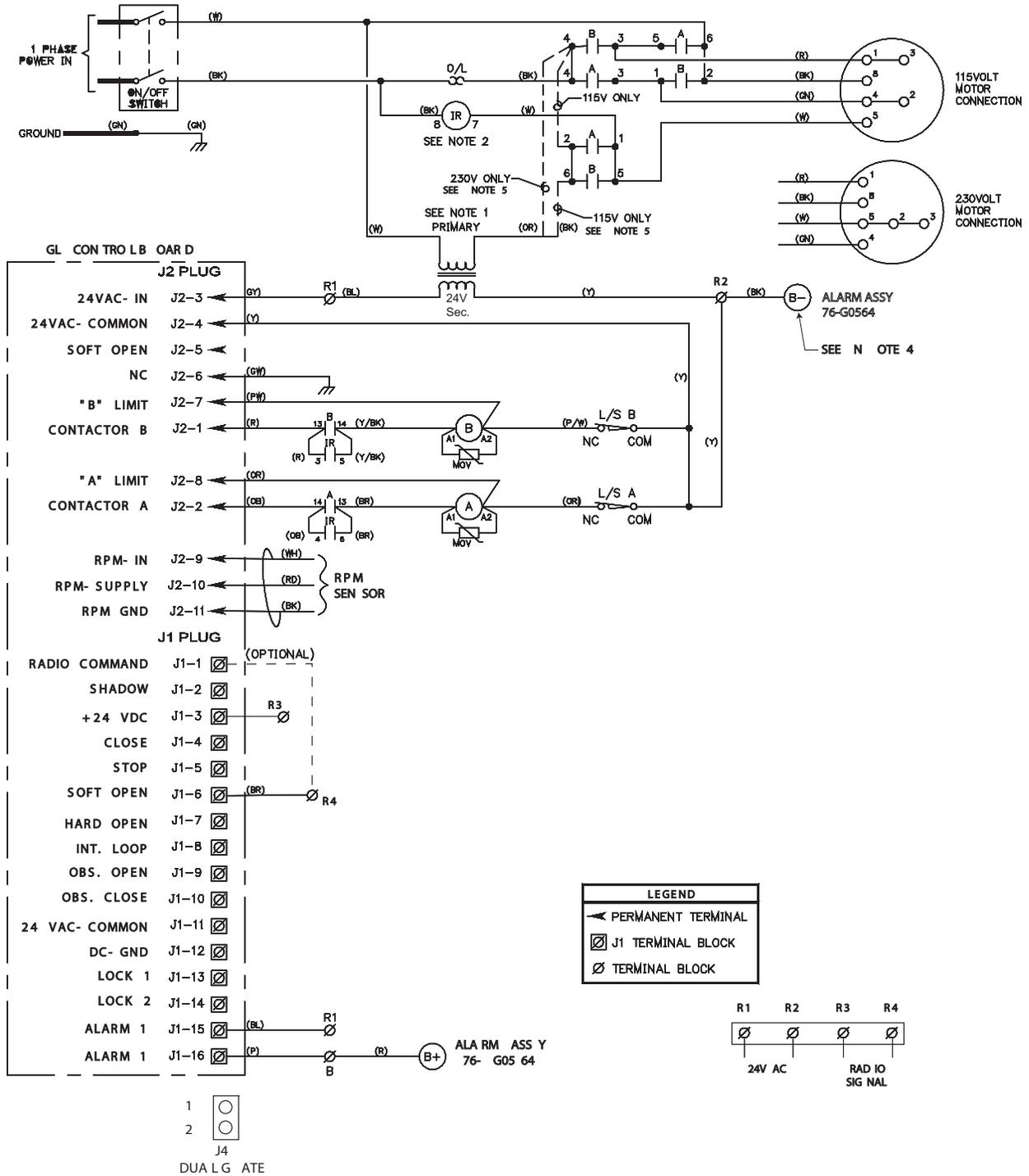
REVISION: E

ECN: 03-0401



845 Larch Avenue, Elmhurst, IL 60125

SINGLE PHASE WIRING DIAGRAM (SW490)



NOTES:

- 1) TRANSFORMER PRIMARY VOLTAGE SAME AS OPERATOR LINE VOLTAGE 24V SECONDARY 60VA.
- 2) RELAY VOLTAGE SAME AS LINE VOLTAGE.
- 3) OPTIONAL WIRE HARNESS.
- 4) (B+) AND (B-) ARE 100dB SAFETY ALARMS.
- 5) WIRE COLOR: 120V BLACK, 208V RED, 230V ORANGE.

APPLICATIONS:

CONTROL WIRING TYPE - GL

FIELD WIRING & ADJUSTMENTS

MODEL TYPES: SW490 (HSW)
 HORSEPOWER: 1/2, 3/4 & 1
 VOLTAGE/PHASE: 115V, 208 & 230V - 1 PHASE ONLY

DRAWING NUMBER:

01-G1979-1

DATE:

7/29/03

REVISION:

E

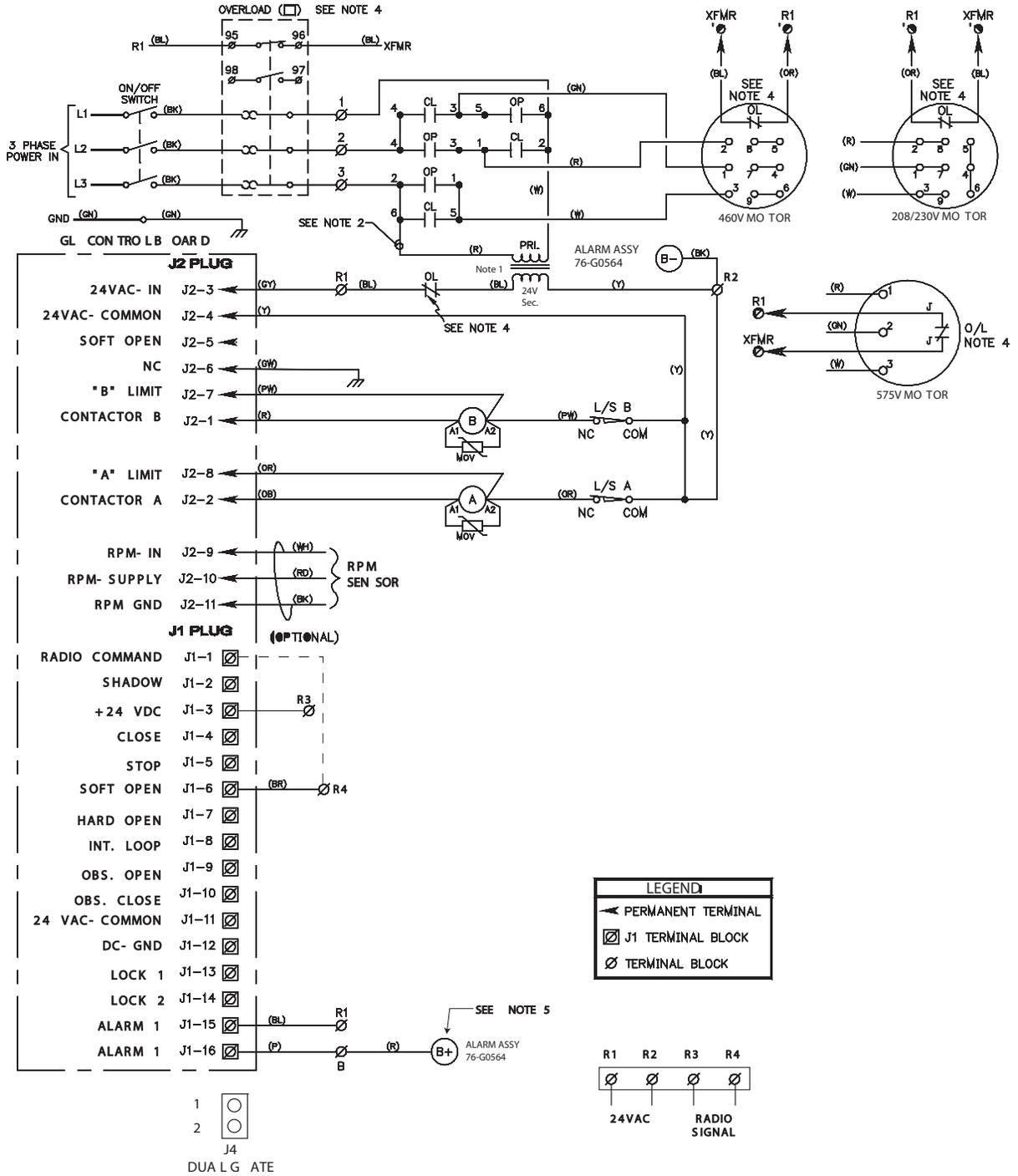
ECN:

03-0401



845 Larch Avenue, Elmhurst, IL 60125

THREE PHASE WIRING DIAGRAM (SW490)



NOTES:

- 1) TRANSFORMER PRIMARY VOLTAGE SAME AS OPERATOR LINE VOLTAGE 24V SECONDARY 60VA.
- 2) WIRE COLOR: 208V RED, 230V ORANGE, 460V VIOLET, 575V GRAY
- 3) OPTIONAL WIRE HARNESS (SEE DRAWING 90-G0532).
- 4) OVERLOAD PROTECTION EITHER IN MOTOR OR FROM AN EXTERNAL OVERLOAD.
- 5) (B+) AND (B-) ARE 100dB SAFETY ALARMS.

APPLICATIONS:

CONTROL WIRING TYPE - GL

FIELD WIRING & ADJUSTMENTS

MODEL TYPES: SW490 (HSW)
 HORSEPOWER: 1/2, 3/4 & 1
 VOLTAGE/PHASE: 208,230,460 & 575V - 3 PHASE ONLY

DRAWING NUMBER:

01-G1979-3

DATE: 7/29/03

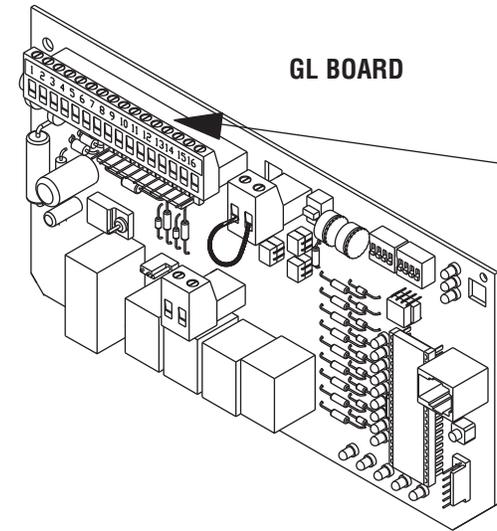
REVISION: E

ECN: 03-0401



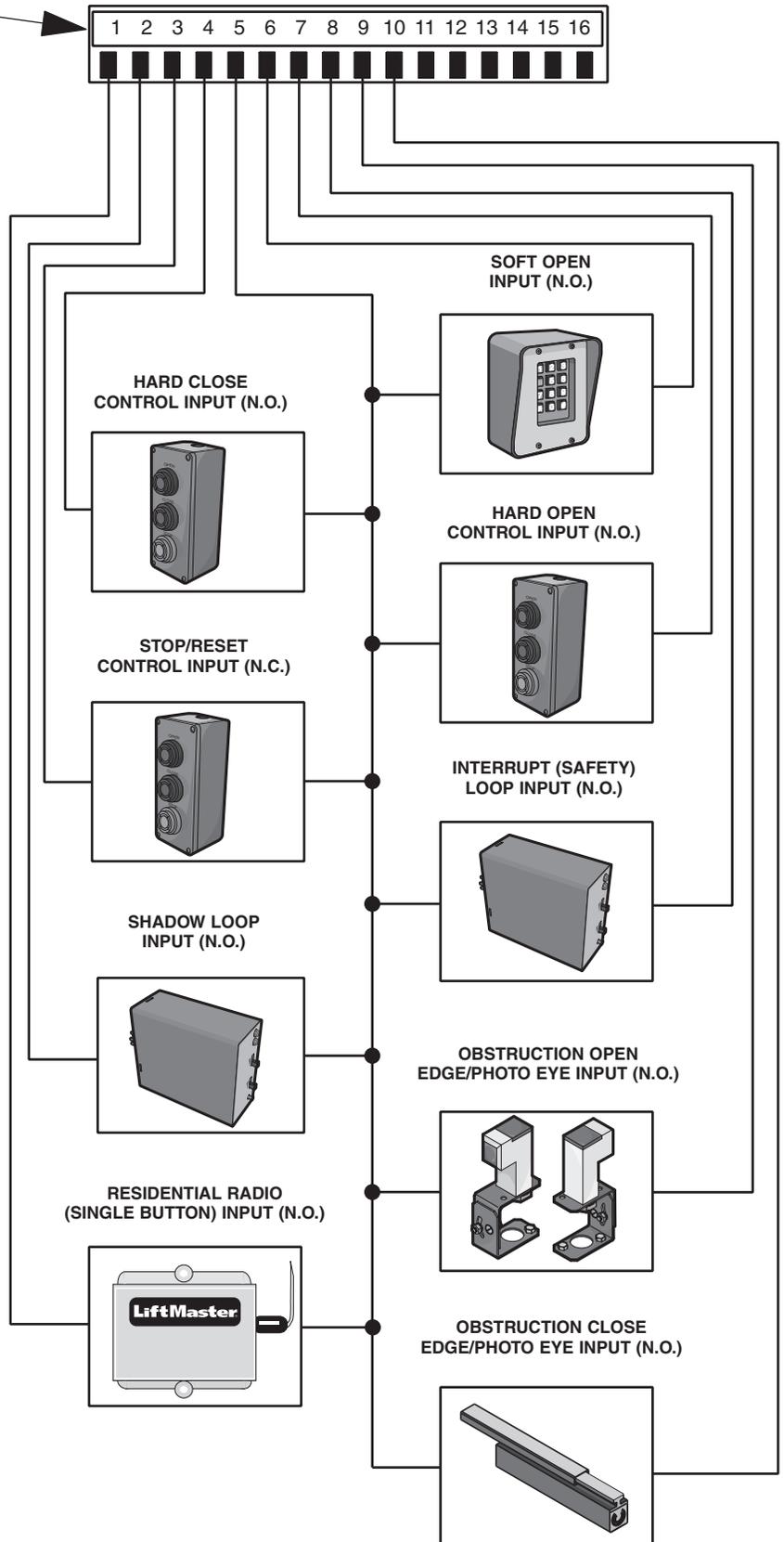
845 Larch Avenue, Elmhurst, IL 60125

CONTROL CONNECTION DIAGRAMS

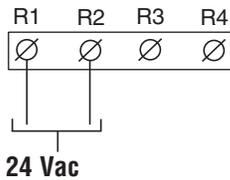


GL BOARD

J1 TERMINAL BLOCK



24Vac ACCESSORY POWER MAY BE FOUND ON THESE TERMINALS



NOTE: See wiring diagrams shipped with kit for additional information. See Owner's Manual for wiring distances and wire gauge information.

WARNING: All controls that are to be used to operate the gate system, **MUST** be installed where the user cannot come into contact with the gate while operating the controls. Also, always install the controls where the user has full view of gate operation.

* All inputs are normally open and momentary, except the stop (N.C.). The following instructions are based upon UL325, and include recommendations for significant increase in safety.

* We strongly recommend that you follow the UL guidelines presented throughout the manual.
Installation device instructions – always follow the instructions provided by the manufacturer when installing and adjusting any control device. If these instructions are contrary to the advice given here, call for assistance.

REPAIR PARTS - SW470

Refer to the parts lists below for replacement parts available for your operator. If optional modifications and/or accessories are included with your operator, certain components may be added or removed from these lists. Individual components of each kit may

not be available. Please consult a parts and service representative regarding availability of individual components. Refer to page 40 for all repair part ordering information.

Complete Electrical Panel Replacement Kits

To order a complete electrical box replacement kit, add a K- prefix to the model number of your operator. For example:

SW420-33-11 (Operator) = K73SW420-33-11 (Electrical Box Kit)

Motor Kits

To order a motor replacement kit, add a K prefix to the number of your motor and remove the second dash (-). For example:

20-5752-33 (Motor Number) = K20-575233 (Motor Kit)

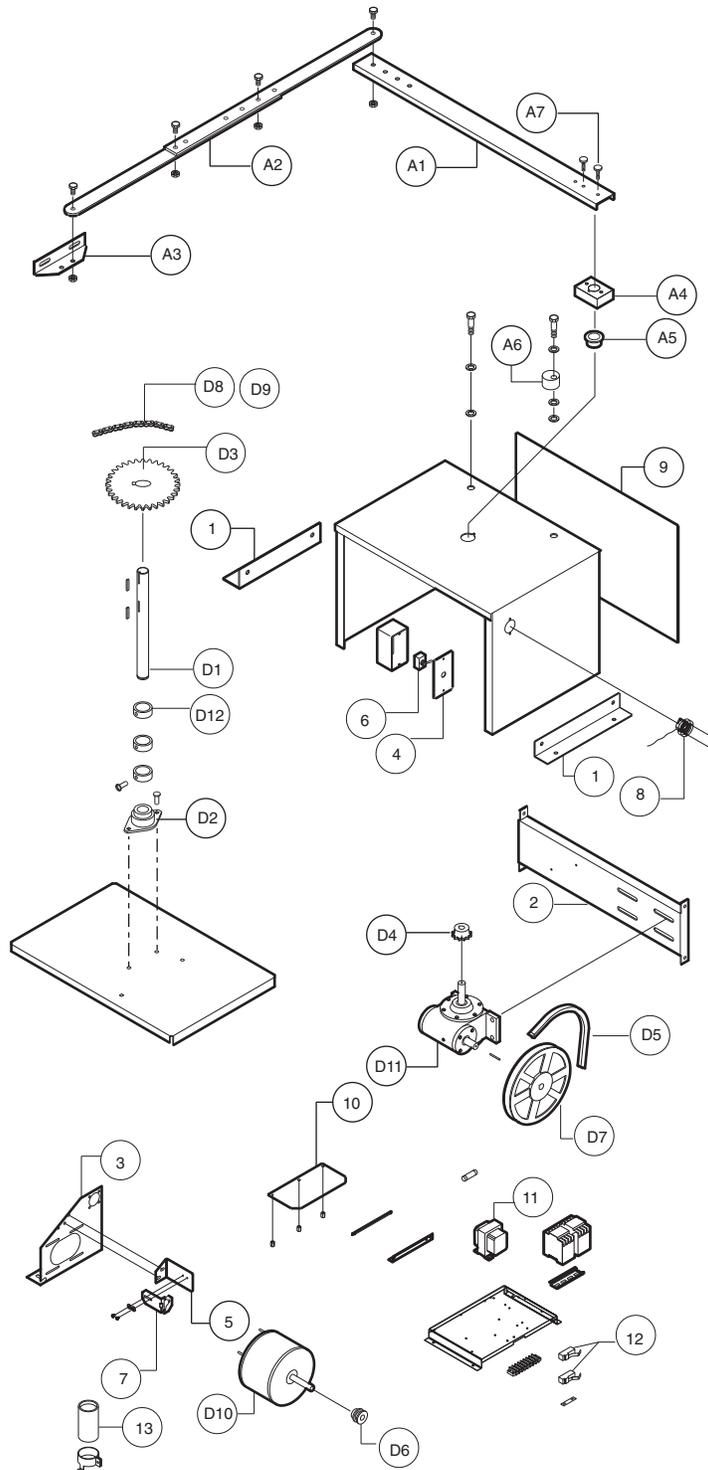
INDIVIDUAL PARTS

ITEM	PART#	DESCRIPTION
1	10-2013	Mounting Bracket
2	10-2103-T	Reducer Bracket
3	10-2104-T	Motor Bracket
4	10-G0326	Switch Box Cover
5	10-G0387	Sensor Support Bracket
6	23-3001	On/Off Switch
7	K74-18382	Hall Effect Sensor Assembly
8	76-G0564	Alarm Assembly
9	10-18461	Side Cover
10	K001A5566	Control Board, GL
11	21-3260-1	Transformer, Dual Voltage 24V
12	G232016	Limit Switch
13	29-3530	Capacitor for 115V
	29-12110	Capacitor for 230V

SERVICE KITS

ITEM	PART#	DESCRIPTION
A1-7	K75-18364	Arm Assembly Kit
A1	10-2108-T	Arm Channel
A2	10-2109	Arm Extension
A3	10-2111	Gate Bracket
A4	07-2101	Arm Hub
A5	12-3000	Bearing 1-1/4" 1/8"
A6	07-2103	Arm Stop
A7	80-2103	Tinnerman Nut
D1-12	K75-18365	Drive Assembly Kit (Motor Not Included)
D1	11-2101	Shaft
D2	12-4164	Self Aligning Flanged Mount Bearing
D3	G152142	Sprocket, 40B42 1x1/4"
D4	15-40B12-EEF	Sprocket, 40B12 5/8"
D5	G162101	Belt 25"
D6	G176017	Pulley for Motor
D7	17-G0475	Molded Pulley 6"
D8	19-2153	Chain, #40-53 Pitches
D9	19-5040	Master Link, #40
D10	G202100	Motor, 115V, 1PH, 1/2HP (Not Included in Kit)
	20-2101-LD	Motor 208/230V, 1PH, 1/2HP (Not Included in Kit)
D11	G322100	Reducer 30:1
D12	75-G0089	Limit Collar Assembly

ILLUSTRATED PARTS - SW470



REPAIR PARTS - SW490

Refer to the parts lists below for replacement parts available for your operator. If optional modifications and/or accessories are included with your operator, certain components may be added or removed from these lists. Individual components of each kit may not be available. Please consult a parts and service representative regarding availability of individual components. Refer to page 40 for all repair part ordering information.

Complete Electrical Panel Replacement Kits

To order a complete electrical box replacement kit, add a K- prefix to the model number of your operator. For example:

SW420-33-11 (Operator) = K73SW420-33-11 (Electrical Box Kit)

Motor Kits

To order a motor replacement kit, add a K prefix to the number of your motor and remove the second dash (-). For example:

20-5752-33 (Motor Number) = K20-575233 (Motor Kit)

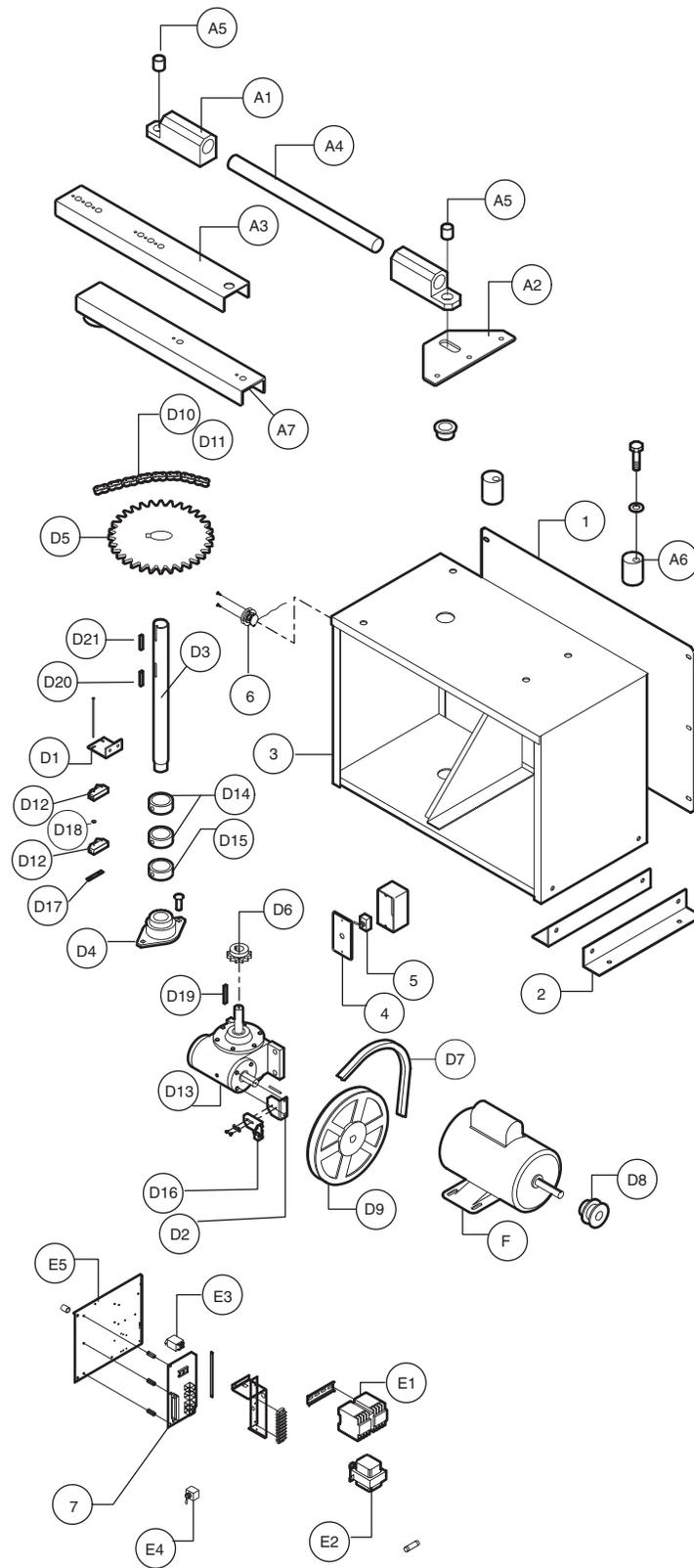
INDIVIDUAL PARTS

ITEM	PART#	DESCRIPTION
A1	08-2001	Rod End Fitting (Not Included in Kit)
1	10-18458	Side Plate Cover
2	10-2013	Mounting Bracket
3	73-18457	Frame Assembly
4	10-G0326	Switch Box Cover
5	23-3001	On/Off Switch, 1PH
	23-3005	On/Off Switch, 3PH
6	76-G0564	Alarm Assembly
7	K001A5566	Control Board, GL

SERVICE KITS

ITEM	PART#	DESCRIPTION
A1-7	K75-18366	Arm Assembly Kit
A1	08-2001	Rod End Fitting (Not Included in Kit)
A2	10-2111	Gate Bracket
A3	70-18618	Extension Arm (Not Included in Kit)
A4	10-3900	Galvanized Tube 39" OD 1" IDx1.315" (Not Included in Kit)
A5	12-10172	Sleeve Bearing
A6	07-2103	Actuator Arm Stop
A7	06-2025-T	Actuator Arm Assembly
D1-21	K75-18367	Drive Assembly Kit (Motor Not Included)
D1	10-2008	Switch Bracket
D2	10-G0539	Sensor Bracket
D3	11-2002	Output Shaft
D4	12-2125	Flange Ball Bearing 1-1/4" Bore
D5	G152002	Sprocket, 50B60 1-1/2x3/8 2-1/4" LTB
D6	15-50B12LGH	Sprocket, 50B12 1/4KW
D7	16-4L280	Belt 28"
D8	17-2002	Pulley, 2", Bore 5/8", Key 3/16"
D9	G172701	Pulley, 7"
D10	19-2075	Chain, #50-75
D11	19-9024	Master Link, #50
D12	G232016	Limit Switch N.C. SPST
D13	32-2001	Gear Reducer
D14	75-G0400	Single Swing Collar
D15	75-G0401	Double Swing Collar
D16	K74-18382	Hall Effect Sensor Assembly
D17	80-1003	Tinnerman Nut
D18	31-2712	Nylon Spacer
D19	80-207-19	Key 1/4x1/4x1-1/2"
D20	80-207-23	Key 3/16x1-3/8"
D21	80-207-25	Key 3/8x3/8x2-1/4"
E1-4		Electrical Panel Assembly Kit
E1	03-8024-K	Contactors 24V
E2	21-3260-1	Transformer, Dual Voltage
E3	24-115-1	Relay 115Vac
	24-230-5	Relay, 208/230V
E4	25-2006	6 Amp Overload Fuse
	25-2008	8 Amp Overload Fuse
	25-2010	10 Amp Overload Fuse
	25-2015	15 Amp Overload Fuse
	25-2020	20 Amp Overload Fuse
	25-4002-5	2.5 Amp Overload Fuse
	25-4006	4.0-6.0 Amp Overload Fuse
F	20-1050-1T	Motor, 115/230V TEFC, 1PH, 1/2HP
	20-1075-1T	Motor, 115/230V TEFC, 1PH, 3/4HP
	20-1100-1T	Motor, 115/230V TEFC, 1PH, 1HP
	20-3050-1T	Motor, 230/460V TEFC, 3PH, 1/2HP
	20-3075B-4T	Motor, 230/460V TEFC, 3PH, 3/4HP
	20-3100B-4T	Motor, 230/460V TEFC, 3PH, 1HP
	20-3050B-5T	Motor, 575V TEFC, 3PH, 1/2HP
	20-3100M-5T	Motor, 575V TEFC, 3PH, 3/4HP
	20-3100-5T	Motor, 575V TEFC, 3PH, 1HP

ILLUSTRATED PARTS - SW490



VARIABLE PARTS - SW490

VARIABLE PARTS LIST - SW490			
PART	PART NO.	DESCRIPTION	USED ON
20-XXXX (Motor)	20-1050-1T	1PH 1/2HP Base Mnt. 115/230V TEFC	SW490-33-11, SW490-33-21, SW490-50-11, SW490-50-21
	20-1075-1T	1PH 3/4HP Base Mnt. 115/230V TEFC	SW490-75-11, SW490-75-21
	20-1100B-2T	1PH 1HP Base Mnt. 115/230V TEFC	SW490-100-11, SW490-100-21
	20-3050-1T	3PH 1/2HP Base Mnt. 230/460V TEFC	SW490-33-23, SW490-33-43, SW490-50-23, SW490-50-43
	20-3075B-4T	3PH 3/4HP Base Mnt. 230/460V TEFC	SW490-75-23, SW490-75-43
	20-3100B-4T	3PH 1HP Base Mnt. 230/460V TEFC	SW490-100-23, SW490-100-43
23-XXXX (Switch)	23-3001	On/Off SW, 1PH	All 1PH
	23-3005	On/Off SW, 3PH	All 3PH
24-XXX-X (Relay)	24-115-1	TPDT, 115V Coil (IR)	All 115V 1PH
	24-230-5	TPDT, 230V Coil (IR)	All 230V 1PH
25-20XX (Overload)	25-2006	6 Amp	SW490-33-21, SW490-50-21, SW490-75-21
	25-2008	8 Amp	SW490-33-11
	25-2010	10 Amp	SW490-50-11, SW490-100-21
	25-2015	15 Amp	SW490-75-11
	25-2020	20 Amp	SW490-100-11
25-40XX (Overload)	25-4001-8K	1.2 to 1.8 Amp	SW490-100-53-G, SW490-75-53-G
	25-4002-5K	1.6 to 2.5 Amp	SW490-100-43-G
	25-4004-K	3.3 to 5.5 Amp	SW490-100-23-G, SW490-100-83-G

SAFETY ACCESSORIES FOR SECONDARY ENTRAPMENT PROTECTION

The following devices are acceptable for Safety Accessories for secondary entrapment protection.

PHOTO-ELECTRIC CONTROLS		
MODEL	DESCRIPTION	VOLTAGE
CPS-N4	Emitter, receiver and mounting brackets - 30' (9 m) Maximum Range	+24V ac/dc
AOMRON	Photocell/Electric Eye - 30' (9 m) Maximum Range	+24V ac/dc
SENSING EDGES		
MODEL	DESCRIPTION	
G65MG0204	Miller MG020 2-wire electric edge for gates. Sensitized on three sides. Requires mounting channel (4' [1.2 m] long).	
G65MG0205	Miller MG020 2-wire electric edge for gates. Sensitized on three sides. Requires mounting channel (5' [1.5 m] long).	
G65ME12C5	Mounting Channel - 5' (1.5 m) long	
G65MGR205	Miller MGR20 2-wire electric edge in 5' (1.5 m) lengths for 2" (5 cm) round post.	
G65MGS205	Miller MGR20 2-wire electric edge in 5' (1.5 m) lengths for 2" (5 cm) square post.	

WARRANTY POLICY AND SERVICE

LIFTMASTER® TWO YEAR LIMITED WARRANTY

The Chamberlain Group, Inc. warrants to the final purchaser of this product, for the structure in which this product is originally installed, that it is free from defect in materials and/or workmanship for a period of two years from the date of purchase. The proper operation of this product is dependent on your compliance with the instructions regarding installation, operation, maintenance and testing. Failure to comply strictly with those instructions will void this limited warranty in its entirety.

If, during the limited warranty period, this product appears to contain a defect covered by this limited warranty, call 1-800-528-2806, toll free, before dismantling this product. Then send this product, pre-paid and insured, to our service center for warranty repair. You will be advised of shipping instructions when you call. Please include a brief description of the problem and a dated proof-of-purchase receipt with any product returned for warranty repair. Products returned to Seller for warranty repair, which upon receipt by Seller are confirmed to be defective and covered by this limited warranty, will be repaired or replaced (at Seller's sole option) at no cost to you and returned pre-paid. Defective parts will be repaired or replaced with new or factory-rebuilt parts at Seller's sole option.

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Some states do not allow the exclusion or limitation of consequential, incidental or special damages, so the above limitation or exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

HOW TO ORDER REPAIR PARTS

OUR LARGE SERVICE ORGANIZATION
SPANS AMERICA
FOR INSTALLATION AND SERVICE INFORMATION,
CALL OUR TOLL FREE NUMBER
1-800-528-2806
www.liftmaster.com

**WHEN ORDERING REPAIR PARTS
PLEASE SUPPLY THE FOLLOWING INFORMATION:
PART NUMBER DESCRIPTION MODEL NUMBER
ADDRESS ORDER TO:**

THE CHAMBERLAIN GROUP, INC.
Technical Support Group
6020 Country Club Road
Tucson, AZ 85706