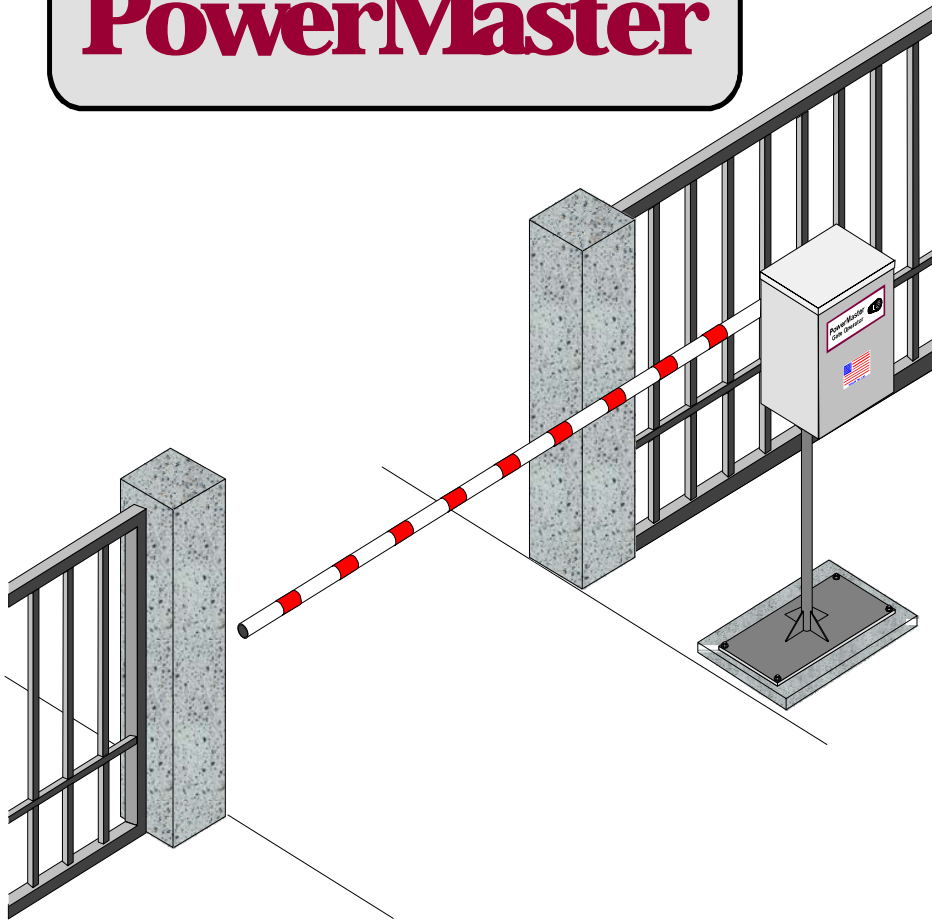


PowerMaster



Installation Manual MBG OPERATOR

MEDIUM DUTY BARRIER GATE OPERATOR

UL 325 AND UL 991 LISTED



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IMPORTANT!

FOR BARRIER GATE OPERATING SYSTEMS

SAFETY IS EVERYONE'S BUSINESS

Automatic gate operators provide convenience and security to users. However, because these machines can produce high levels of force, it is important that all gate operator 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 a component part of a total gate operating system.

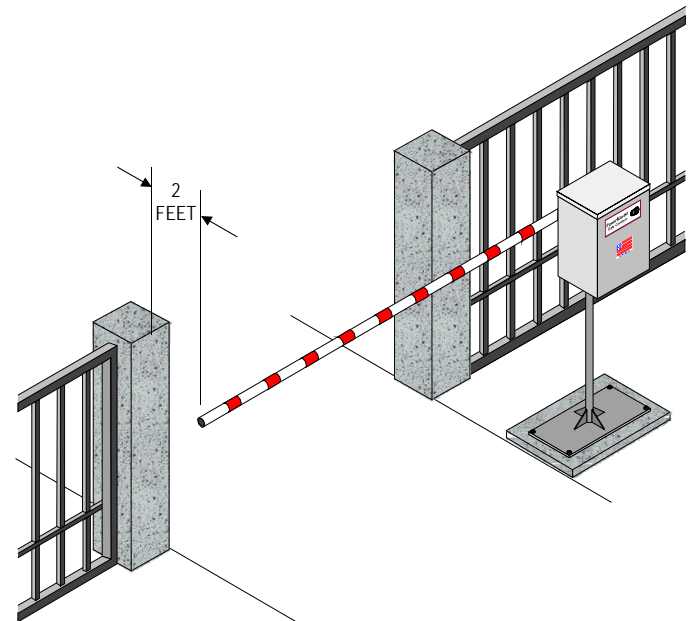
The following information contains various safety precautions and warnings for the system designer, installer and end user. These instructions provide an overview of the importance of safe design, installation, and use.

Warnings are identified with the ▲ symbol. This symbol will identify some of the conditions that can result in serious injury or death. Take time to carefully read and follow these precautions and other important information provided to help ensure safe system design, installation and use.

▲ **WARNING:** Gate operators are only one part of a **TOTAL GATE OPERATING SYSTEM**. It is the responsibility of purchaser, designer, and installer to ensure that the total system is safe for its intended use. All secondary entrapment safety devices must be **RECOGNIZED** by **U/L** to ensure the safety of the complete operating system.

SYSTEM DESIGNER SAFETY INSTRUCTIONS

- ▲ 1. Familiarize yourself with the precautions and warnings for the installer. Users are relying on your design to provide a safe installation. The installation should have an entrapment protection system installed such as photoelectric sensors or an electric edge.
- ▲ 2. When designing a system that will be entered from a highway or main thoroughfare be sure the system is placed far enough away from the road to eliminate traffic backup. Distance from the road, size of the gate, usage levels, and gate cycle/speed must be considered to eliminate potential traffic hazards.
- ▲ 3. Design the gate system so a person cannot be trapped between the arm and any other fixed structure. All rigid objects must be at least 2 feet from gate arm.



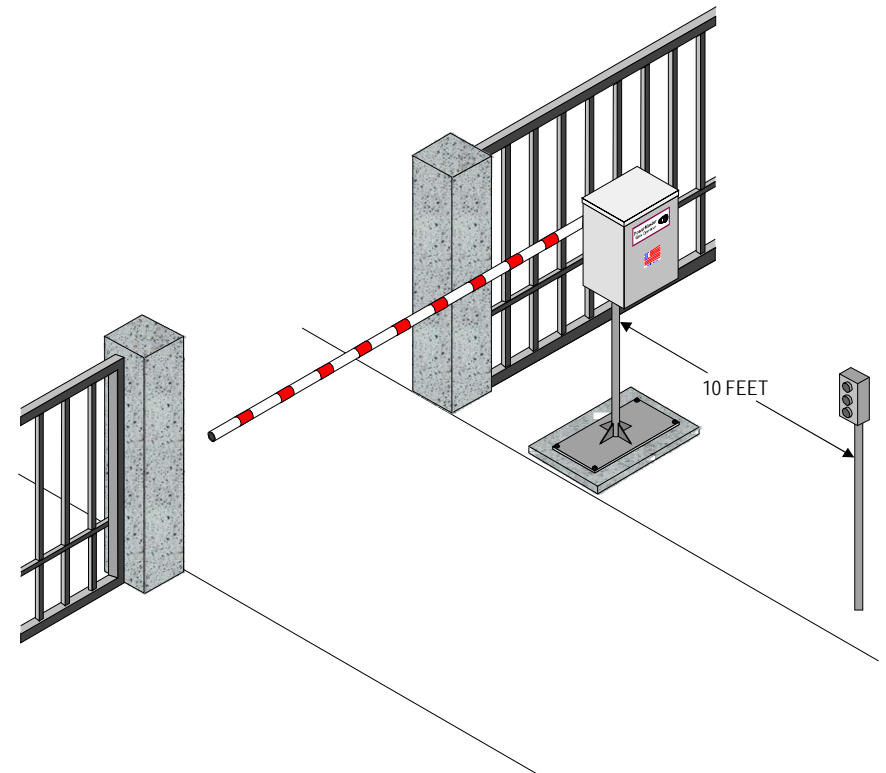
INSTALLER SAFETY INSTRUCTIONS

BEFORE INSTALLATION

- ▲ 1. Check to see that the operator is proper for this type and size of opening and its frequency of use. If you are not sure, consult factory.
- ▲ 2. Check to see that there are no structures adjacent to the area, which may pose a risk of entrapment when gate is opening or closing.
- ▲ 3. Safety equipment such as electric edges or photocell sensors must be installed to provide personnel, equipment, and property protection. For assistance in selecting the correct type of safety equipment, consult the factory.
- ▲ 4. You must install a pushbutton control or key switch to allow for normal operation of the gate if the automatic controls do not work. Locate the pushbutton or key switch and small warning placard within sight of the gate in a secured area at least 10 feet or more from the gate and fence to keep users away from the moving gate and fence.
- ▲ 5. Outdoor or easily accessed gate controls should be of the security type to prohibit unauthorized use.

DURING INSTALLATION

- ▲ 1. Be aware of all moving parts and avoid close proximity to any pinch points.
- ▲ 2. Disconnect power at the control panel before making any electric service connections. Connection location for controls and safety equipment can be found on the wiring diagram, and in this manual.
- ▲ 3. Locate the controls at least 10 feet from the moving gate so that the user can observe the gate operation, but is not able to come in contact with the gate while operating the controls.



AFTER INSTALLATION

- ▲ You are responsible for ensuring that the end user understands the basic operations and safety systems of the unit, including the proper way to engage and manually operate the unit.
- ▲ Point out that the safety instructions in brochure are the responsibility of the end user, and then **LEAVE A COPY OF THIS BROCHURE WITH THE END USER**

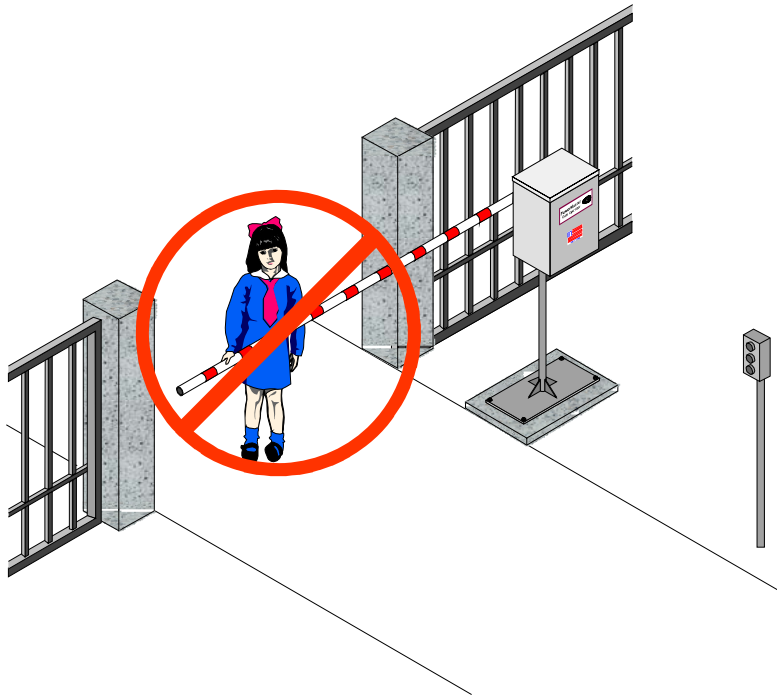
END-USER SAFETY WARNINGS

Be sure you've been fully instructed on the sequence of operation for your specific gate system(s). Keep the gate properly maintained and have a qualified service person make repairs.

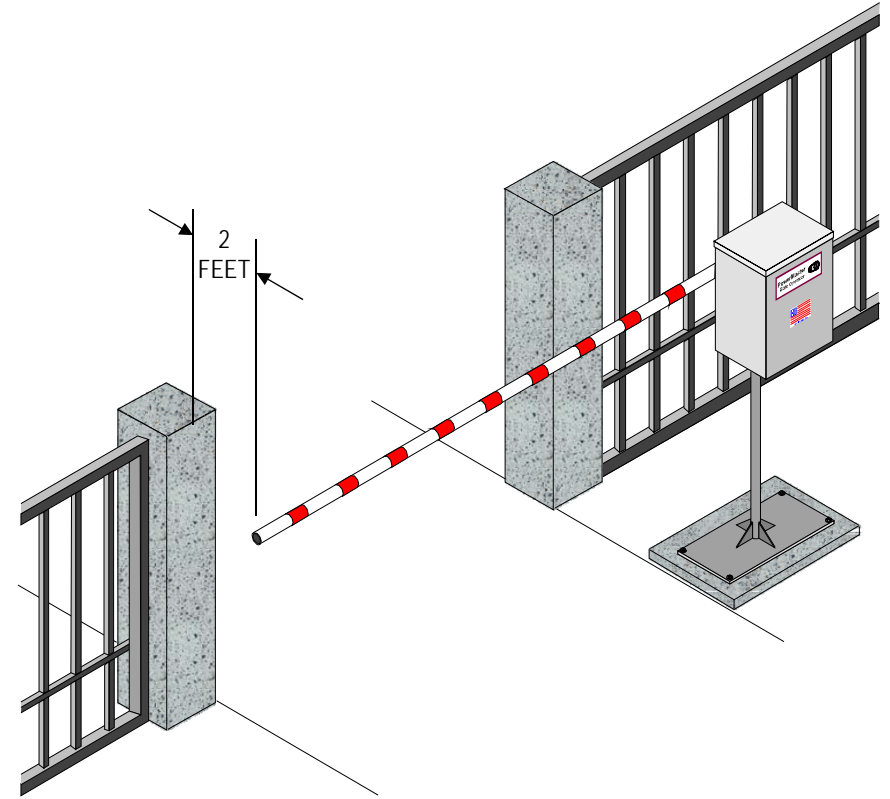
- ▲ 1. Be sure the following safety instructions are distributed to all persons authorized to use your gate.
- ▲ 2. **KEEP GATEWAY CLEAR AT ALL TIMES.** Your automatic gate is not for pedestrian use. No one should ever cross the path of the moving gate.



- ▲ 3. **DO NOT** allow children to play near your gate, or to operate the gate.



- ▲ 4. **DO NOT** operate your gate system unless you can see it when the gate moves.
- ▲ 5. Be sure a pushbutton or key switch has been installed for manual electric operation in the event your radio or card does not work. Any mounted control station should be located a minimum of 10 feet from the gate so the gate cannot be touched. Any pushbutton located in a building should be installed within sight of the gate.
- ▲ 6. **DO NOT** operate any controls without watching the movement of the gate.
- ▲ 7. Be sure the gate arm DOES NOT come within 2 feet of any rigid object, therefore causing an entrapment situation.



- ▲ 8. If your gate closes automatically, loop detectors should be installed to detect the presence of a vehicle.
- ▲ 9. If a contact or non-contact safety system has been installed check for proper operation at least once per month. **If these functions are observed to operate improperly, discontinue use and have it serviced immediately!**
- ▲ 10. To ensure safe operation of this equipment, you must read this safety manual and keep it for reference.

MANUAL OPERATION

- ▲ . Please refer to page 18 for Manual Operation Instructions.

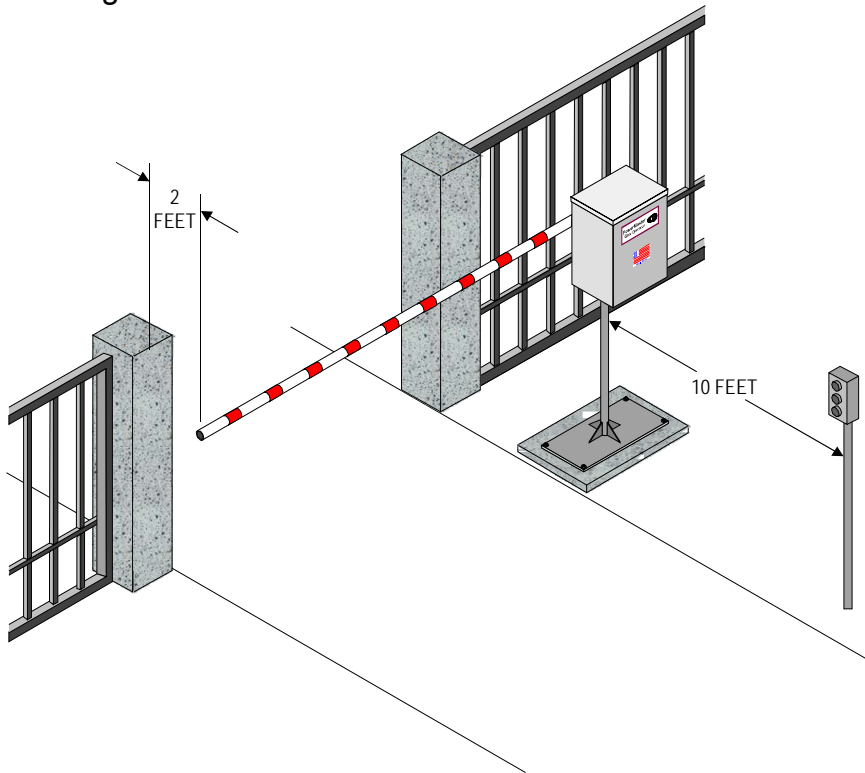
INSTALLATION INSTRUCTIONS

WARNING: DO NOT APPLY POWER UNTIL TOLD TO DO SO! RISK OF ELECTRICAL SHOCK OR INJURY MAY RESULT!

BEFORE INSTALLING OPERATOR

IMPORTANT:

1. Operator should always be mounted inside the gate.
2. All controls are to be mounted at least 10' from the gate arm.

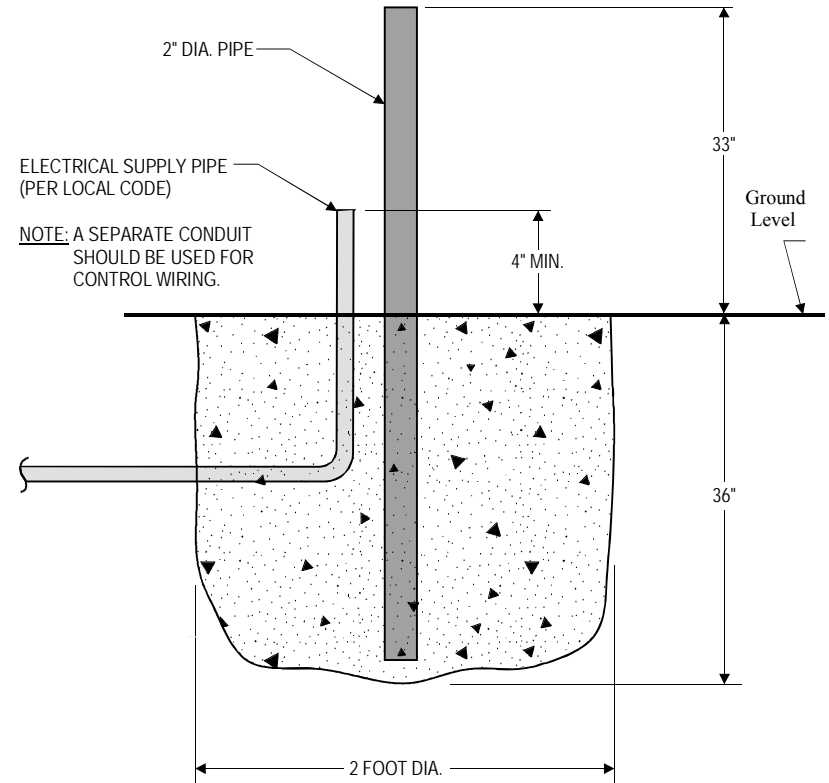


3. Allow at least 2 feet clearance from rigid objects to gate arm.

INSTALLATION OF MOUNTING PIPE

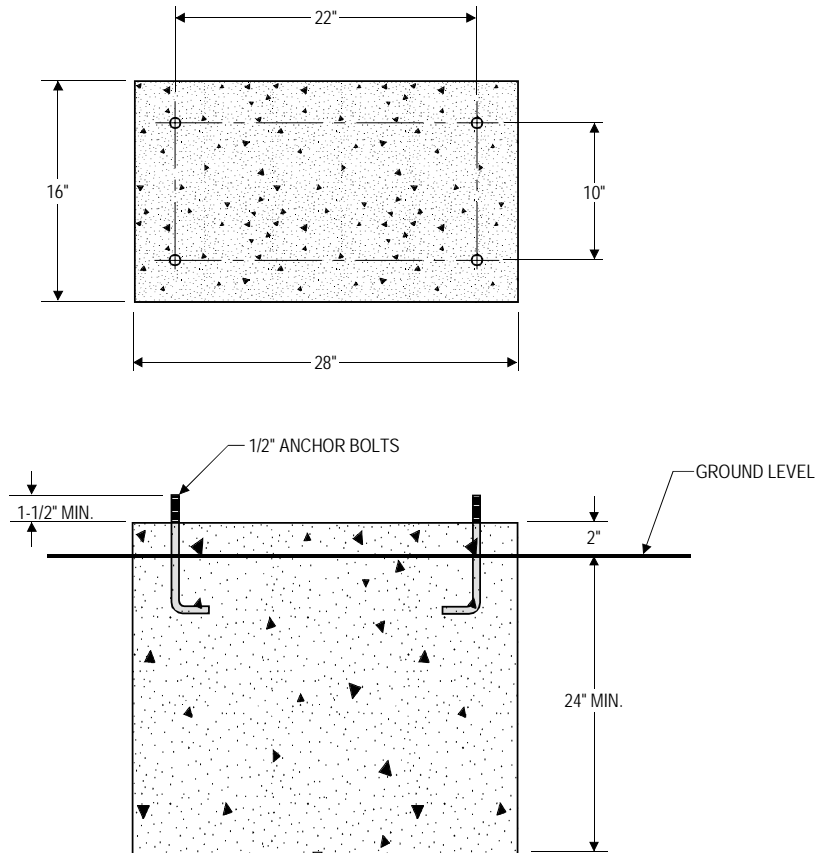
Note: There are two options for the installation of a mounting pipe.

1. Cement a 69" long, 1-1/2 inch pipe (approximately 2" diameter) in the ground as shown below.



Note: Let cement cure for two days before proceeding.

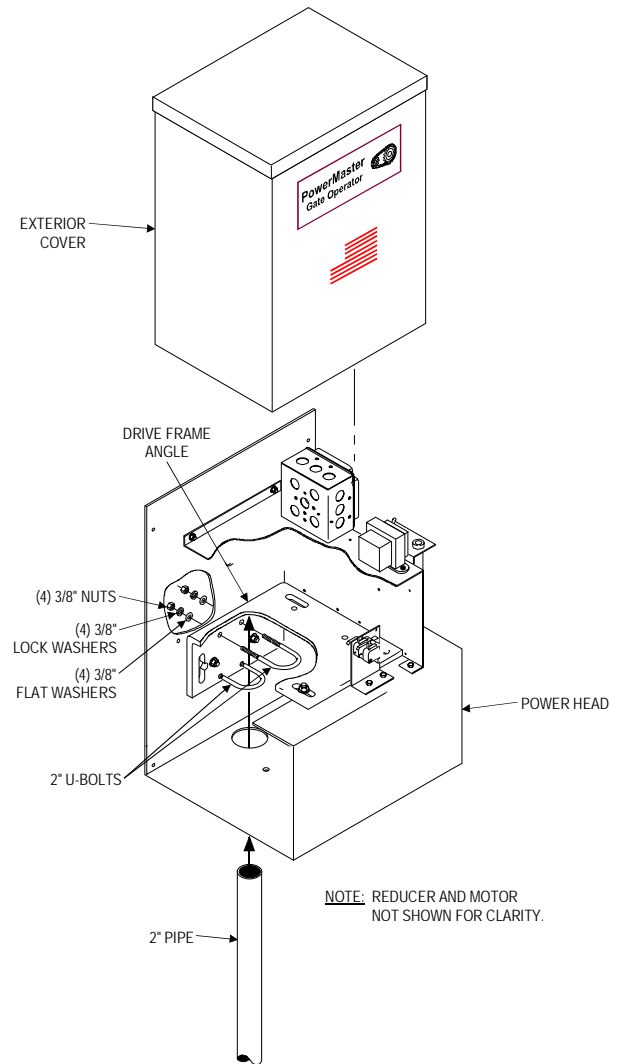
2. Install a mounting pad as shown below, for use with optional pipe stand available through your dealer.



Note: Let cement cure for two days before proceeding.

INSTALLATION OF POWER HEAD

1. Remove exterior cover and install (2) 2" U-bolts as shown below.

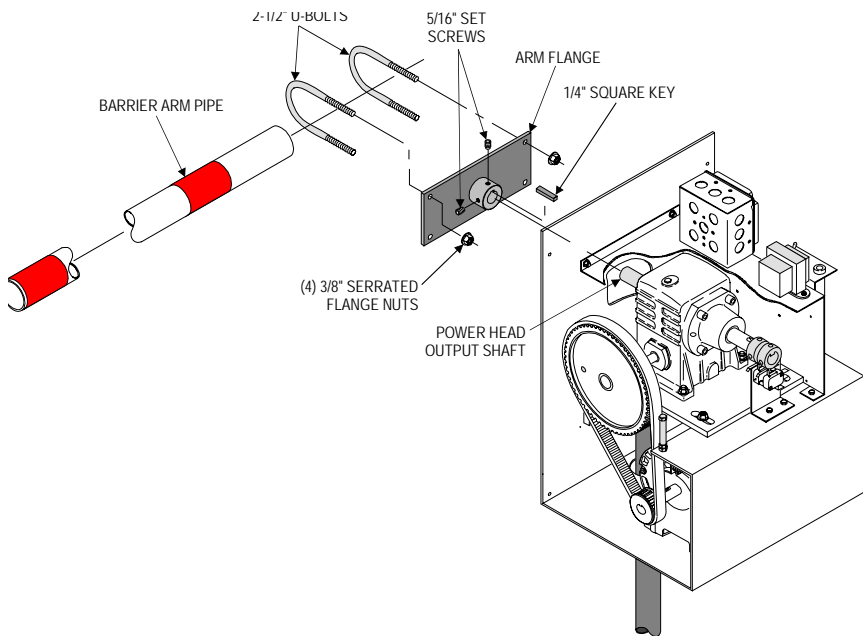


NOTE: REDUCER AND MOTOR NOT SHOWN FOR CLARITY.

2. Install 3/8 flat washers, 3/8 lock washers, and 3/8 nuts.
3. Mount power head on top of pipe by inserting pipe up through large hole in bottom of operator frame, through the two u-bolts until it stops against drive frame angle.

INSTALLATION OF BARRIER ARM

1. Install arm flange on power head output shaft as shown figure below ,and secure position with 1/4" square key and (2) 5/16 set screws.
2. Install (2) 2-1/2" U-bolts in arm flange as shown.
3. Install 3/8 serrated flange nuts loosely on U- bolts.
4. Insert barrier arm pipe through two U-bolts and secure the desired position by tightening the 3/8 serrated flange nuts on the u-bolts.



ELECTRICAL CONNECTIONS

WARNING- DO NOT APPLY POWER UNTIL TOLD TO DO SO. RISK OF SHOCK OR INJURY MAY RESULT!

NOTE: Wiring to operator must use watertight materials in accordance with local electric code. See wire gauge/distance charts for proper sizing. Master/Slave installations should have **SEPARATE** power supply wiring or length of wire runs

should be figured at half that shown on the chart. **This unit must be grounded in accordance with N.E.C. and local codes.**

Before connecting the operator, use a voltmeter to determine that the electrical service is 115V. **THIS OPERATOR CANNOT BE CONNECTED AT 230 VOLTS.** Damage will result which is not covered under warranty.

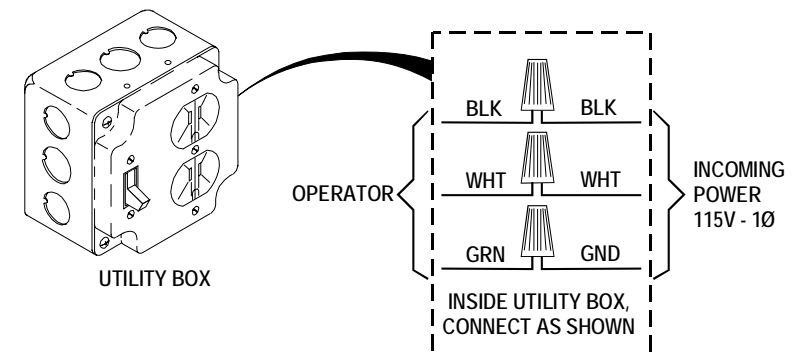
LOW VOLTAGE WIRE GAUGE/DISTANCE CHART	
24 AWG:	Up to 150'
20 AWG:	150' - 200'
18 AWG:	250' - 1,500'

Control wiring should be run as twisted pairs. **DO NOT** run control wires in the same conduit as power wires, telephone wires, or loop detector leads.

Line Voltage	HP	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG
115 VAC	1/2	150	250	400	500	650

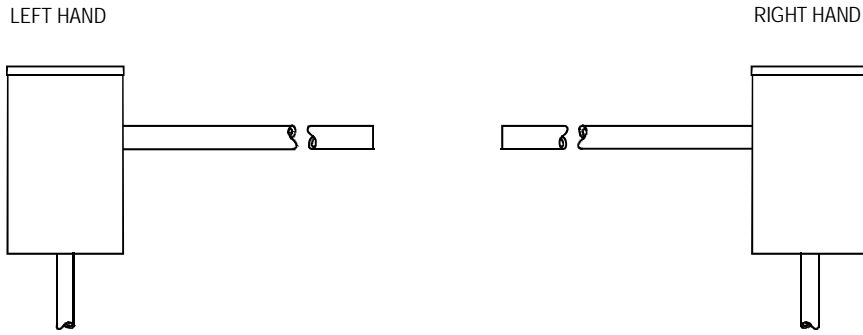
1. Be sure power switches at source and operator are OFF.
2. Connect incoming power lines and ground wire as shown below.

Hot leg (black) to BLACK; Neutral (white) to White; Ground to GREEN



LEFT HAND/RIGHT HAND CONVERSIONS

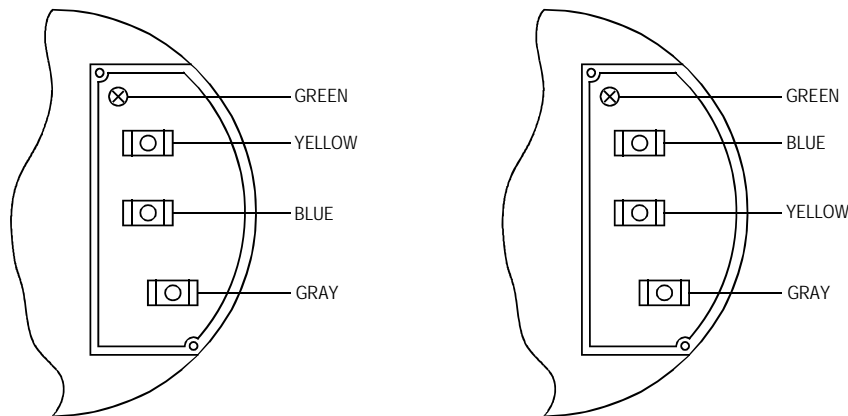
1. Determine the hand of the operator required for this installation by referring to the illustration below.



Note: Operators are wired for Right Hand operation at the factory.

2. Place the Yellow and Blue wires in the appropriate positions, as shown below, for Right Hand or Left Hand operation.

Note: If operator hand is being changed, limits **MUST** be reset.



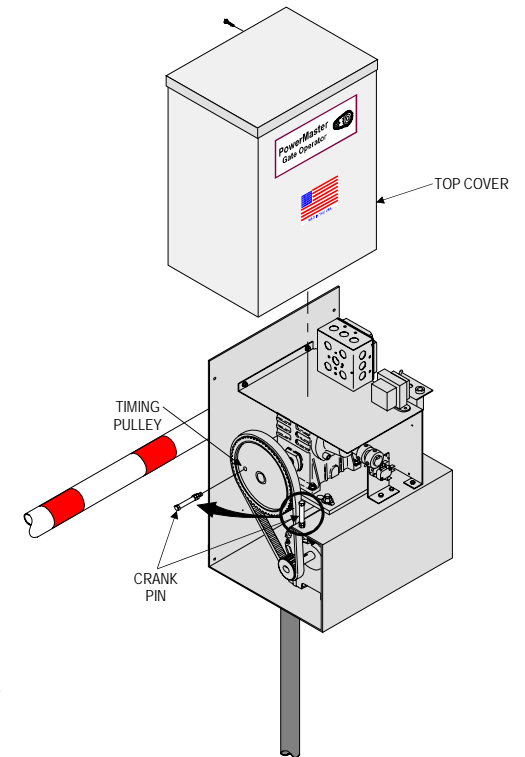
BACK OF MOTOR,
LEFT HAND MOTOR CONNECTIONS

BACK OF MOTOR,
RIGHT HAND MOTOR CONNECTIONS

MANUAL OPERATION

▲ WARNING: TURN OFF POWER SUPPLY BEFORE REMOVING COVER.

1. Remove (4) cover mounting screws and lift off top cover.
2. Remove crank pin from storage area in drive frame. See Diagram. **Note: This will disengage interlock and prevent power from returning to the operator during manual operation.**
3. Insert crank pin in timing pulley as shown in diagram. Rotate timing pulley with crank pin until desired position is achieved.

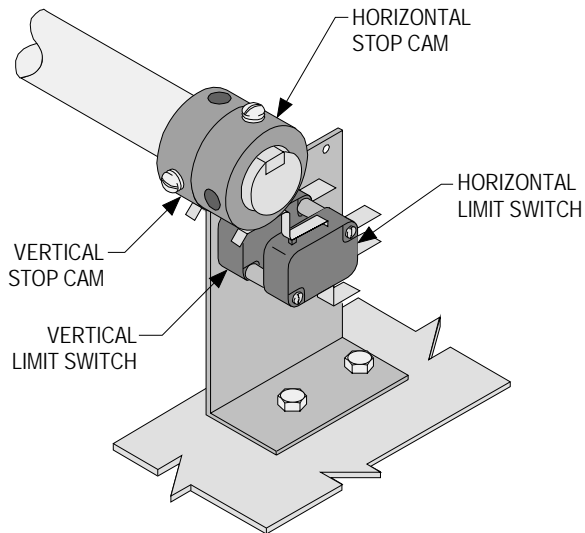


4. To resume powered operation, remove crank pin from timing pulley and replace in storage area on drive frame.
- ▲ Note: Be sure drive pin is fully inserted back into drive frame in order to activate interlock.**
5. Replace cover and secure with (4) mounting screws.
6. Turn on supply power to operator.

LIMIT ADJUSTMENT PROCEDURE

▲ WARNING: TURN OFF POWER SUPPLY BEFORE MAKING ANY ADJUSTMENTS.

1. After the operator has been installed and the Barrier Arm secured in position, rotate the arm to the horizontal position using manual crank as shown in previous section.
2. Loosen the set screw on the horizontal stop cam and rotate the cam, (counterclockwise for a **Right Hand** installation and clockwise for a **Left Hand** installation) until it just actuates the horizontal limit switch. (See diagram.) Secure this position by tightening set screw.



3. Rotate the Arm to the straight up, vertical position. Loosen the set screw on the vertical stop cam and rotate the cam, (clockwise for a **Right Hand** installation and counterclockwise for a **Left Hand** installation) until it just actuates the vertical limit switch. (See diagram.) Secure this position by tightening set screw.
4. Remove crank pin from timing pulley and replace in storage area on drive frame. **Note: Be sure drive pin is fully inserted back into drive frame in order to activate interlock.**
5. Turn on power, then raise and lower barrier arm using the control switch next to outlet box.

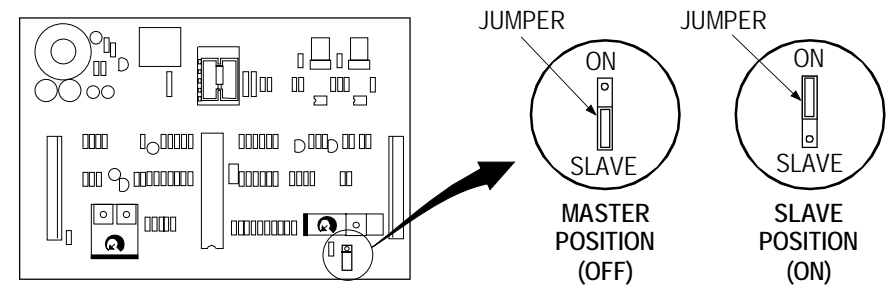
▲ WARNING: TURN OFF POWER BEFORE MAKING ADJUSTMENTS!!!

6. Make minor adjustments to limit cams as required to obtain the desired "OPEN" and "CLOSED" positions.

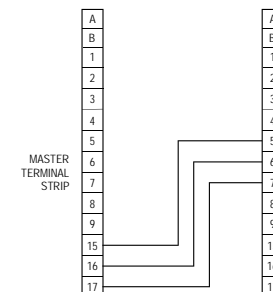
MASTER - SLAVE OPERATION

NOTE: A single unit is considered a MASTER. For MASTER-SLAVE installation, one unit must be converted to LEFT HAND operation, as shown on page 16. All units are shipped as "MASTER" from the factory.

1. Leave jumper on the MASTER operator's circuit board in the "OFF" position.
2. Move jumper on SLAVE operator's circuit board to the "ON" position.



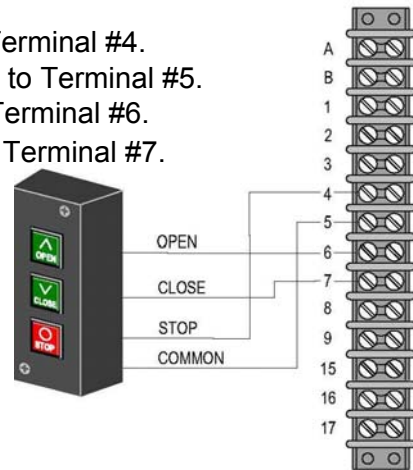
3. Connect terminal #15 of MASTER unit to terminal #5 of SLAVE unit.
4. Connect terminal #16 of MASTER unit to terminal #6 of SLAVE unit.
5. Connect terminal #17 of MASTER unit to terminal #7 of SLAVE unit.



CONNECTION OF A 3 BUTTON STATION

NOTE: All Control contacts must be **NORMALLY OPEN**.

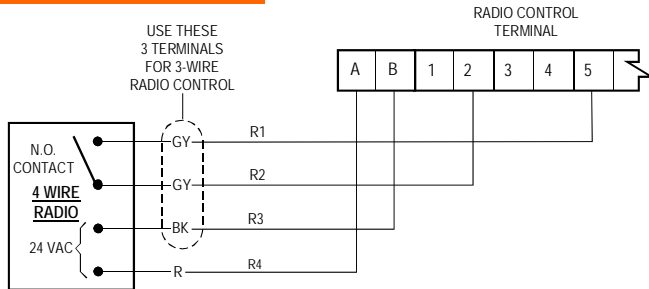
- Connect "STOP" button to Terminal #4.
- Connect "COMMON" button to Terminal #5.
- Connect "OPEN" button to Terminal #6.
- Connect "CLOSE" button to Terminal #7.



RADIO CONTROL INSTALLATION

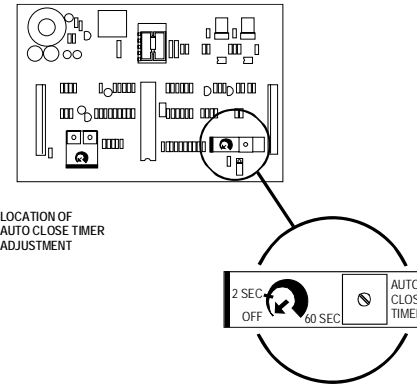
A Three or Four wire radio control receiver can be installed on this operator. See the diagrams below for the correct connections to match your installations equipment and desired functions.

NOTE: If your radio's connecting wires are not color coded as shown, see the radio's installation manual to determine which wires are for the normally open contacts and which require the 24 VAC Power Supply.



NOTE: The radio connections shown above are for "OPEN ONLY" operation. Therefore the "TIMER TO CLOSE" option must be activated for closing. (See next section.) If alternate "Open" - "Close" operation is desired move wire on terminal strip from terminal #2 to terminal #1.

TIMER TO CLOSE OPTION



LOCATION OF AUTO CLOSE TIMER ADJUSTMENT

The operator is equipped with a timer to close option for use with **OPEN ONLY** control devices such as a radio control, or card key control. The **AUTO RECLOSE TIMER** adjustment screw is located on the printed circuit board. The operator is shipped from the factory with this timer preset to the off position; fully counter clockwise. As the timer adjustment screw is rotated

clockwise, the closing of the gate can be delayed from 2 seconds to 60 seconds. The timer to close will only be activated whenever the gate is in the full open position.

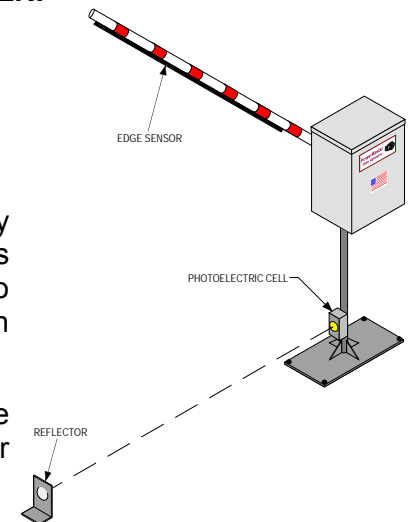
INSTALLATION OF EDGE SENSOR OR PHOTOEYES

NOTE: 24 VAC power is available between terminals A & B for devices such as photo eyes, wireless edges, etc. **All safety device contacts must be NORMALLY OPEN.**

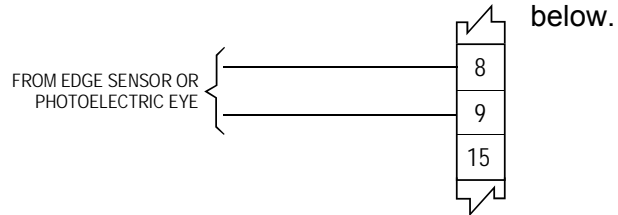
1. Install edge sensor or photoelectric eye system as shown. Photocells should be installed at least 10" above the ground.

NOTE: All hard wiring to safety edges must be installed so there is no threat of mechanical damage to wiring between components, when the gate is moving.

NOTE: A separate pedestrian gate must be installed if there is no other entry access but the vehicular gate.

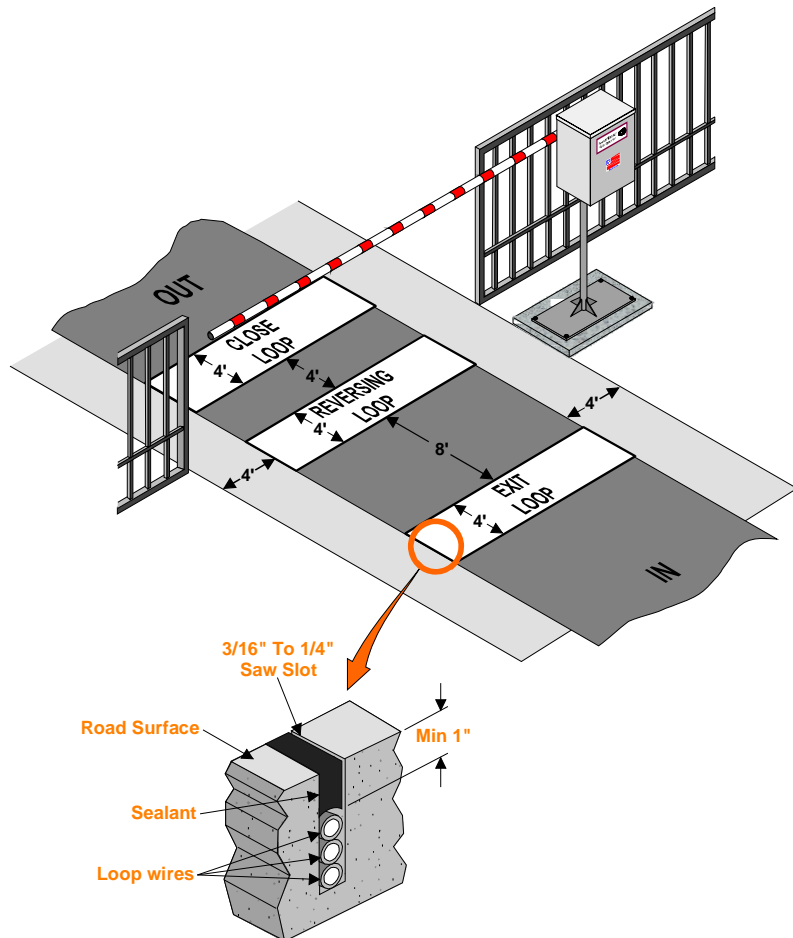


2. Electrically connect sensing system to operator terminal strip as shown



1. The **EXIT LOOP** provides a signal to open the gate when a vehicle enters the loop zone.
2. The **REVERSING LOOP** protects a vehicle in the loop zone from being contacted with the gate by over riding any close signal while the gate is open, and by reversing the gate if closing.
3. The **CLOSE LOOP** provides a signal to close the gate when a vehicle exits the loop.

LOOP DETECTOR SYSTEMS AND INSTALLATION



LOOP INSTALLATION

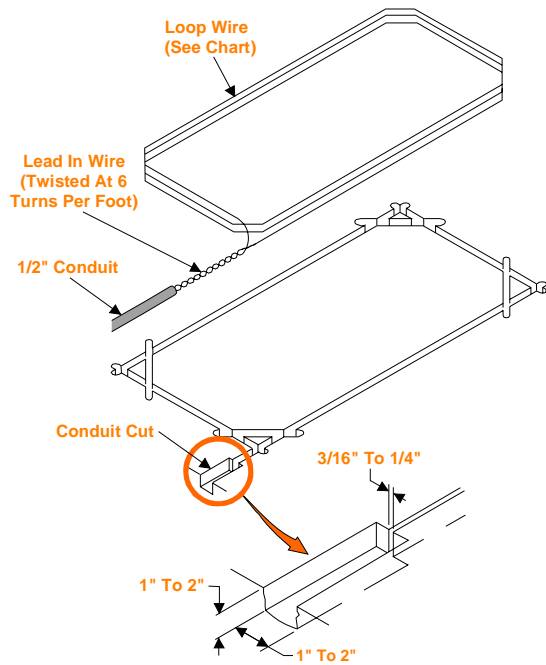
STANDARD LOOP LAYOUTS
For 36" High Detection

1. Layout the desired loop locations per the diagram. The standard size chart at right will give an approximate length of wire required for various loop dimensions and number of turns required.

CAUTION: The Loop wires and Lead-in wires must be a continuous piece of wire without splices. Only use wire intended for this type of application. (Type XHHW insulation 16AWG)

NOTE: Buried steel from drains or other systems may affect functioning of the loop system. Check with the factory for advice on any special installations. (1-800-243-4476).

LOOP SIZE	# TURNS	LOOP WIRE LENGTH (FT)
4' X 4'	4	64'
4' X 6'	4	80'
4' X 8'	3	72'
4' X 10'	3	84'
4' X 12'	3	96'
4' X 14'	3	108'
4' X 16'	3	120'
4' X 18'	3	132'
4' X 20'	3	144'
4' X 22'	3	156'
4' X 24'	3	168'
4' X 26'	3	180'
4' X 28'	3	192'
4' X 30'	2	136'
4' X 32'	2	144'
4' X 34'	2	152'
4' X 36'	2	160'
4' X 38'	2	168'
4' X 40'	2	176'



2. Cut the required groove as shown in the diagram at left at the locations laid out in **Step #1**.

3. Leave enough wire for the LEAD IN, and insert the specified number of turns of wire into the cut grooves. (See chart page 24.)

CAUTION: Be careful not to damage the wire insulation during installation.

4. After completing the required number of loop turns, twist the ends together at the rate of **6** turns per foot to form the **LEAD-IN**.

5. Seal the **LEAD-IN** wire in the conduit to prevent moisture seepage into the conduit.

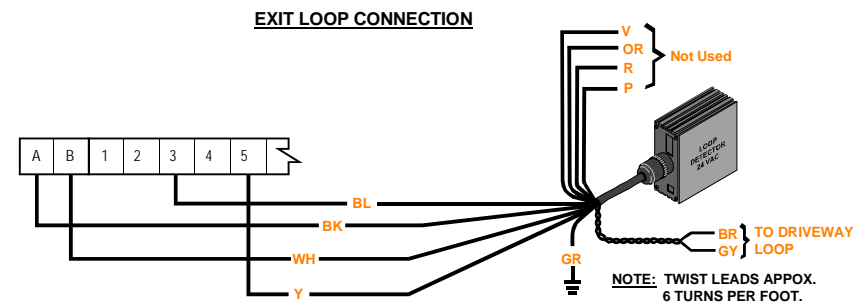
6. Fill over the loop wires in the groove with a recommended loop sealant. Contact your distributor for available sealants.

7. Mount the loop detector in the operator and connect the wire loop.

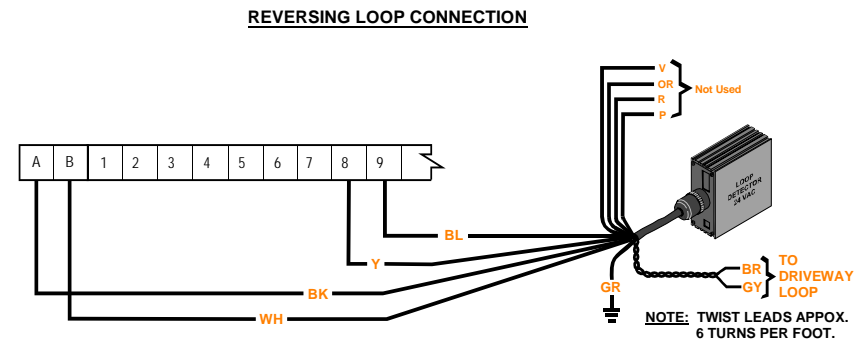
8. Connect loop detector to the control board as shown in the following diagrams.

Note: The following diagrams show single loop connections. For multiple loop connections consult the loop detector's instruction manual, or call the Power Master Technical line at 1-800-243-4476.

1. The **EXIT LOOP** provides a signal to open the gate when a vehicle enters the loop zone.



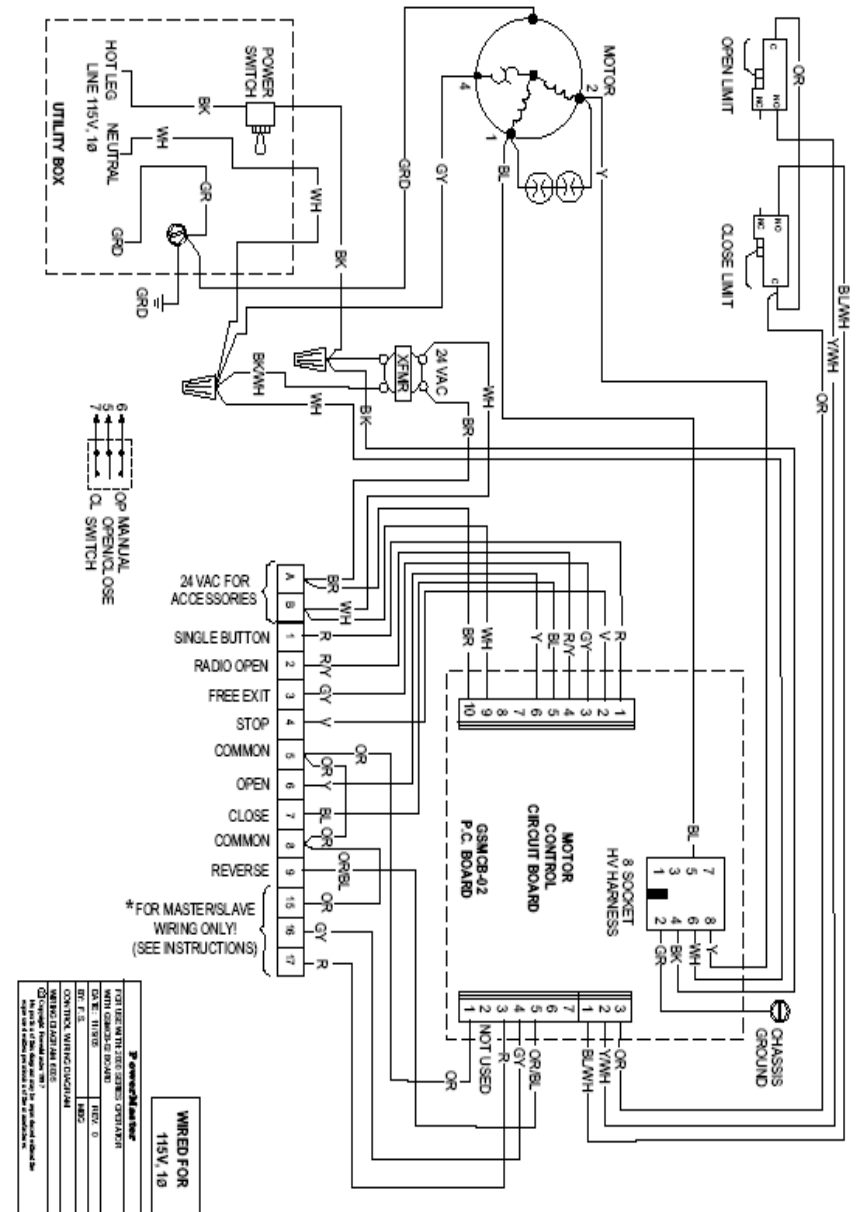
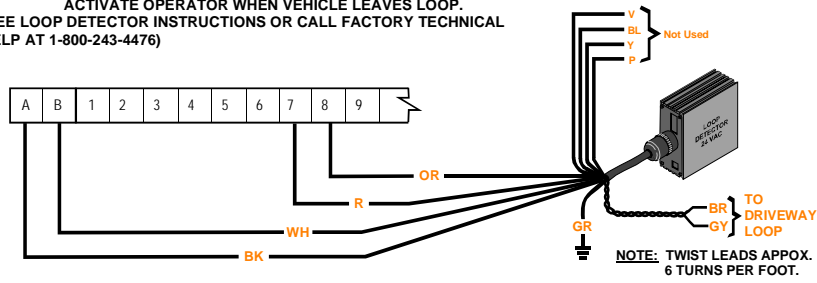
2. The **REVERSING LOOP** protects a vehicle in the loop zone from being contacted with the gate by over riding any close signal while the gate is open, and by reversing the gate if closing.



3. The **CLOSE LOOP** provides a signal to close the gate when a vehicle exits the loop.

CLOSE LOOP CONNECTION

▲ **WARNING** LOOP DETECTOR MUST BE PROGRAMMED TO ACTIVATE OPERATOR WHEN VEHICLE LEAVES LOOP. (SEE LOOP DETECTOR INSTRUCTIONS OR CALL FACTORY TECHNICAL HELP AT 1-800-243-4476)



Wired for 115V, 1Ø	
FOR USE WITH THE SERIES OPERATOR WITH REMOTE BOARD	REV. 0
OR: 115V	REV. 0
CONTROL WIRING DIAGRAM	REV. 0
WIRING DIAGRAM	REV. 0
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PowerMaster

Limited 5 Year Warranty

PowerMaster warrants all gate operators to be free of defects in materials and workmanship for a period of Five (5) years from date of purchase. If any part is found to be defective during this period, new parts will be furnished free of charge. Failure of this product due to misuse, improper installation, alterations, vandalism, or lack of maintenance is not covered under this warranty, and voids any other implied warranties herein.

PowerMaster is not responsible for any labor charges incurred in connection with the installation of warranted parts.

In order to activate this warranty, the registration form on opposite page MUST be completed and returned within THIRTY CALENDER DAYS FROM DATE OF PURCHASE VIA CERTIFIED MAIL. If registration is not activated, a one year warranty will apply.

R&S Automation
7200 E. 92nd Avenue
Unit A
Portland, OR 97266
877-388-4001
503-771-4685
Fax 503-774-6708

John Greene Corp.
2807 Center Circle Drive
Downers Grove, IL 60515
800-374-7890
Fax 630-627-7995

R & S Automation Inc.
15075 Wicks Blvd
San Leandro, CA 94577
800-543-6001
510-357-4110
Fax 510-483-1326

R & S Automation Inc.
1560 N. Missile Way
Anaheim, CA 92801
800-963-3111
714-449-1645
Fax 714-449-1679

John Greene Corp.
3024 Avenue E. East
Arlington, Tx 76011
800-925-7890
Fax 817-633-5735

John Greene Corp.
3516 E. Norvell Bryant Hwy.
Hernando, FL 34442
800-323-3674
Fax 352-726-8999

Power Door Products
610 Fenimore Rd.
Mamaroneck, NY 10543
914-698-5083
Fax 914-698-6866

Toll Free technical support @ 1-800-243-4476
Email to techsupport@power-master.net



Call 1- 800 - 323 - 3674
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Warehouses across the country w/
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Prompt delivery from stock

Special operators normally ship
within 7 days

06-0926 MBG

Model MBG

Date Installed _____

Serial # _____

Location Installed:

Address: _____

Address: _____

Address: _____

Installer's Information

Company Name _____ Company Telephone # _____

Company Address _____ Company Contact _____

Company Address _____

Company Address _____