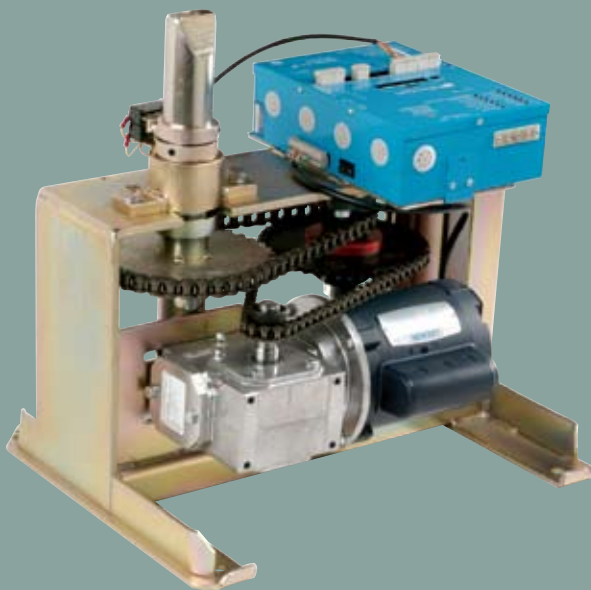


Swing Gate Operators Installation and Maintenance Manual



DORENE

GATE OPENERS



DS 4020
DS 4020H
DS 4020HX



DST 4520



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LIMITED WARRANTY SUMMARY

(For Normal Wear and Tear)

DoreneL.L.C warrants all gate openers to be free of defects in material & workmanship for a period of 4 years for commercial use and 6 years for residential use, i.e. single residence, from date of purchase. Any mechanical part or parts found defective within this period, at the manufacturer's option, shall be repaired or replaced free of charge.

FOB our factory.

The above warranty is in lieu of all other warranties expressed or implied and shall be void in cases of acts of God, vandalism, improper installation or improper maintenance.

The electronics are warranted for a period of 2 years under the same requirements.

GENERAL SAFETY INFORMATION

READ THROUGH THE INSTALLATION INSTRUCTIONS COMPLETELY BEFORE BEGINNING INSTALLATION, AND THEN PERFORM THEM IN THE ORDER GIVEN

IMPORTANT SAFETY INSTRUCTIONS

Warning: To reduce the risk of injury or death

1. Read and follow all instruction carefully.
 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 a 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 gate properly maintained. Read the owner's manual. Have a qualified service person make repairs to gate hardware.
 7. The entrance is for vehicles only. Pedestrians must use separate entrance.
 8. Save these instructions.
-

FOR GATE OPERATORS UTILIZING A NON-CONTACT SENSOR

1. See Manufacturers instructions on the placement of non-contact sensors for each type of application.
 2. 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.
 3. 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.
-

FOR GATE OPERATORS UTILIZING A CONTACT SENSOR

1. One or more contact sensors shall be located at the leading edge, trailing edge, and post mounted both inside and outside of a vehicular horizontal slide gate.
2. A hard wired contact sensor shall be located, and it's wiring arranged, so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
3. A wireless contact sensor such as 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.

INSTALL THE GATE OPERATOR ONLY WHEN:

1. The operator is appropriate for the construction of the gate and the usage class of the gate.
2. All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a
3. Minimum of 4' (1.2m) above the ground to prevent a 2.25" (57.15mm) 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.
4. All exposed pinch points are eliminated or guarded
5. Guarding is supplied for exposed rollers
The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening.

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.

The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate

6. For gate operator utilizing type D protection
7. The gate operator controls must be placed so that the user has full view of the gate area when the gate is moving. The placard as required by 52a.1.6 shall be placed adjacent to the controls
8. An automatic closing device (such as a timer, loop sensor, or similar device) shall not be employed. No other activation device shall be connected.
9. Controls must be far enough from the gate so that the user is prevented from coming in contact with the gate while operating the controls. Controls intended to be used to reset an operator after two sequential activations of the entrapment protection device or devices must be located in the line-of-sight of the gate.

All warning signs and placards must be installed where visible in the area of the gate.

GATE OPERATOR

Usage Class	Horizontal Slide		Swing	
Vehicular I and II	A	B1, B2, or D	A or C	A, B1, C or D
Vehicular III	A, B1, or B2	A, B1, B2, D or E	A, B1 or C	A, B1, C, D or E
Vehicular IV	A, B1, B2, or D	A, B1, B2, D or E	A, B1, C or D	A, B1, C, D or E

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

ENTRAPMENT PROTECTION TYPES:

Type A Inherent entrapment sensing system.

Type B1 Provision for connection of, or supplied with, a non-contact sensor (photoelectric sensor or the equivalent).

Type B2 Provision for connection of, or supplied with, a contact sensor (edge device or the equivalent).

Type C Inherent adjustable clutch or pressure relief device.

Type D Provision for connection of, or supplied with, an actuating device requiring continuous pressure to maintain opening or closing motion of the gate.

Type E An inherent audio alarm.

IMPORTANT INSTALLATION INSTRUCTIONS

DS 4020 / DS 4020H / DS 4020HX (ONLY)

GATE OPERATION

The gate must swing freely with no binding of hinges, or other gate hardware before any operator is connected to the gate.

PAD AND OPERATOR LOCATION

Position the pad as indicated in Figure #1. Failure to do so may cause erratic operation resulting in reduced operator life.

The gate “pick up point” (G1) dimension from the hinge point should be 1/3 to 1/4 of the gate length. The dimensions shown above are examples only.

Note: The bold dimensions are good for gates up to fourteen feet, while the underlined dimensions are good for gates up to twenty feet, 90 degree operation. If the instructions are awkward or impossible for your specific application, please contact the factory for a suitable variation.

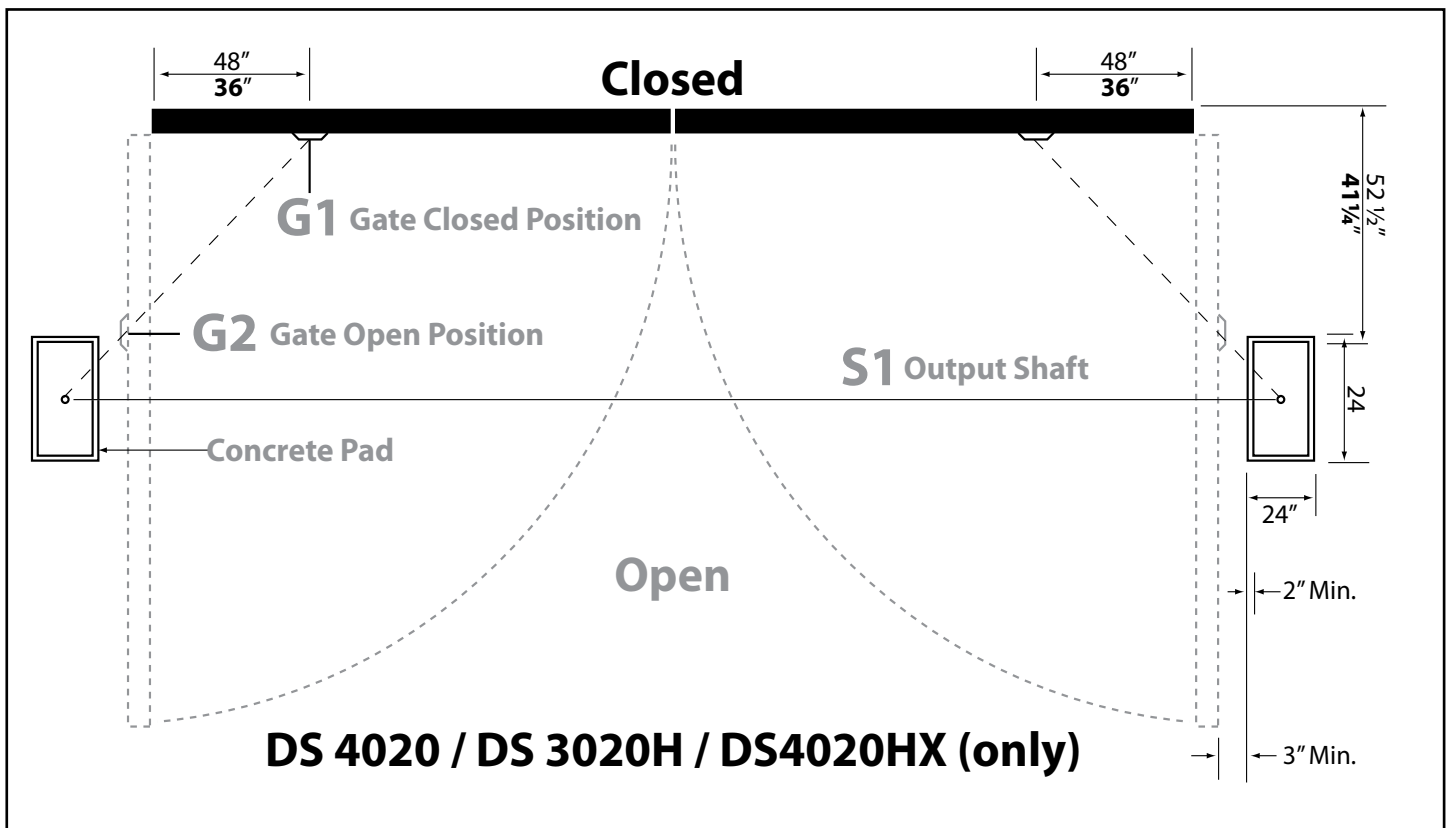


Figure 1

CONCRETE PAD CONSTRUCTION AND LAYOUT

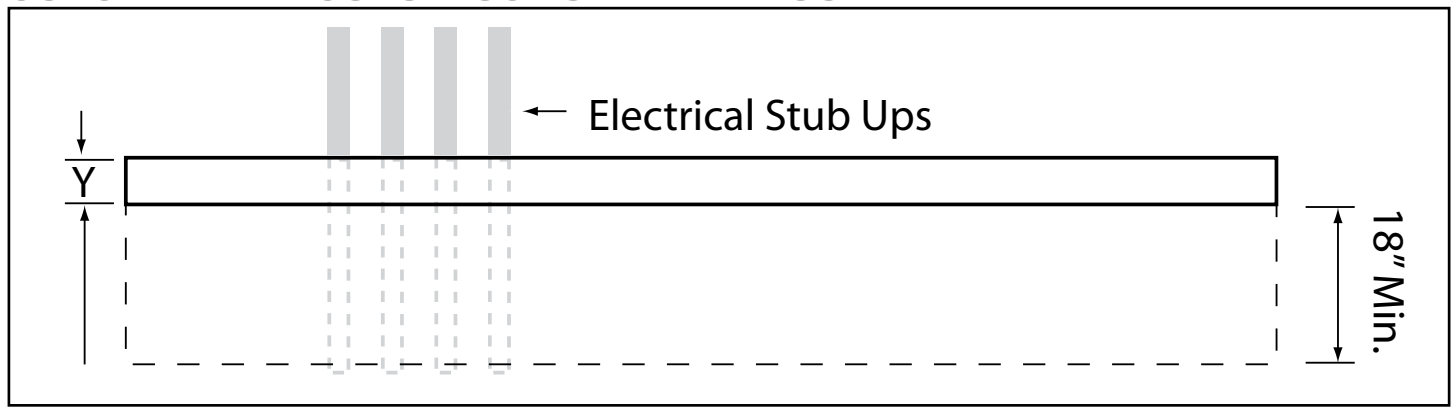


Figure 2 (Side View)

Y dimension in Figure 2 must be high enough so that water will not stand under the operator in a worst case scenario.

Soil conditions may vary but in sandy or loose soil the pad should be at least 18"-24" inches deep.

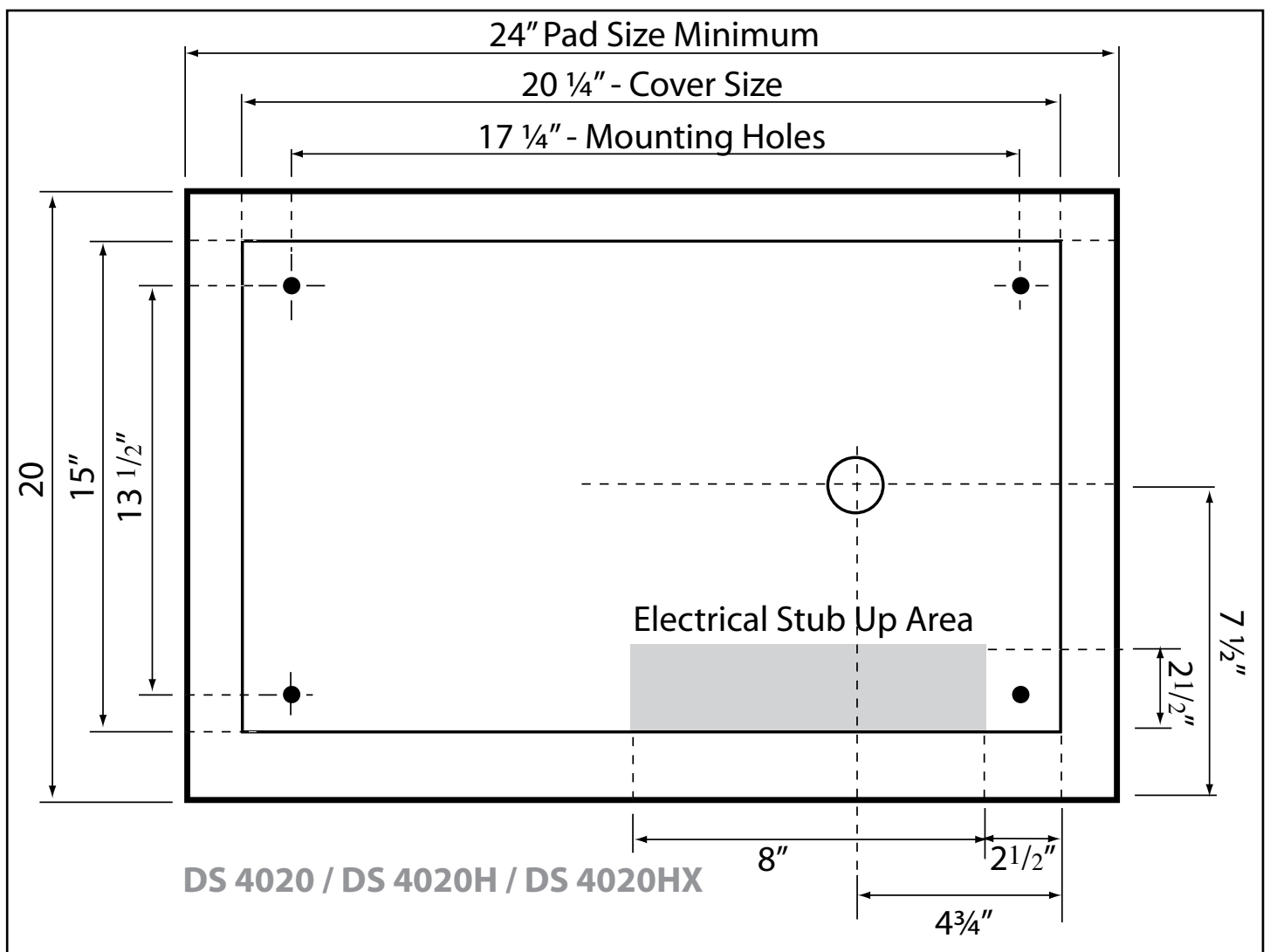


Figure 3 (Top View)

IMPORTANT INSTALLATION INSTRUCTIONS

DST 4520 (ONLY)

GATE OPERATION

The gate must swing freely with no binding of hinges, or other gate hardware before any operator is connected to the gate.

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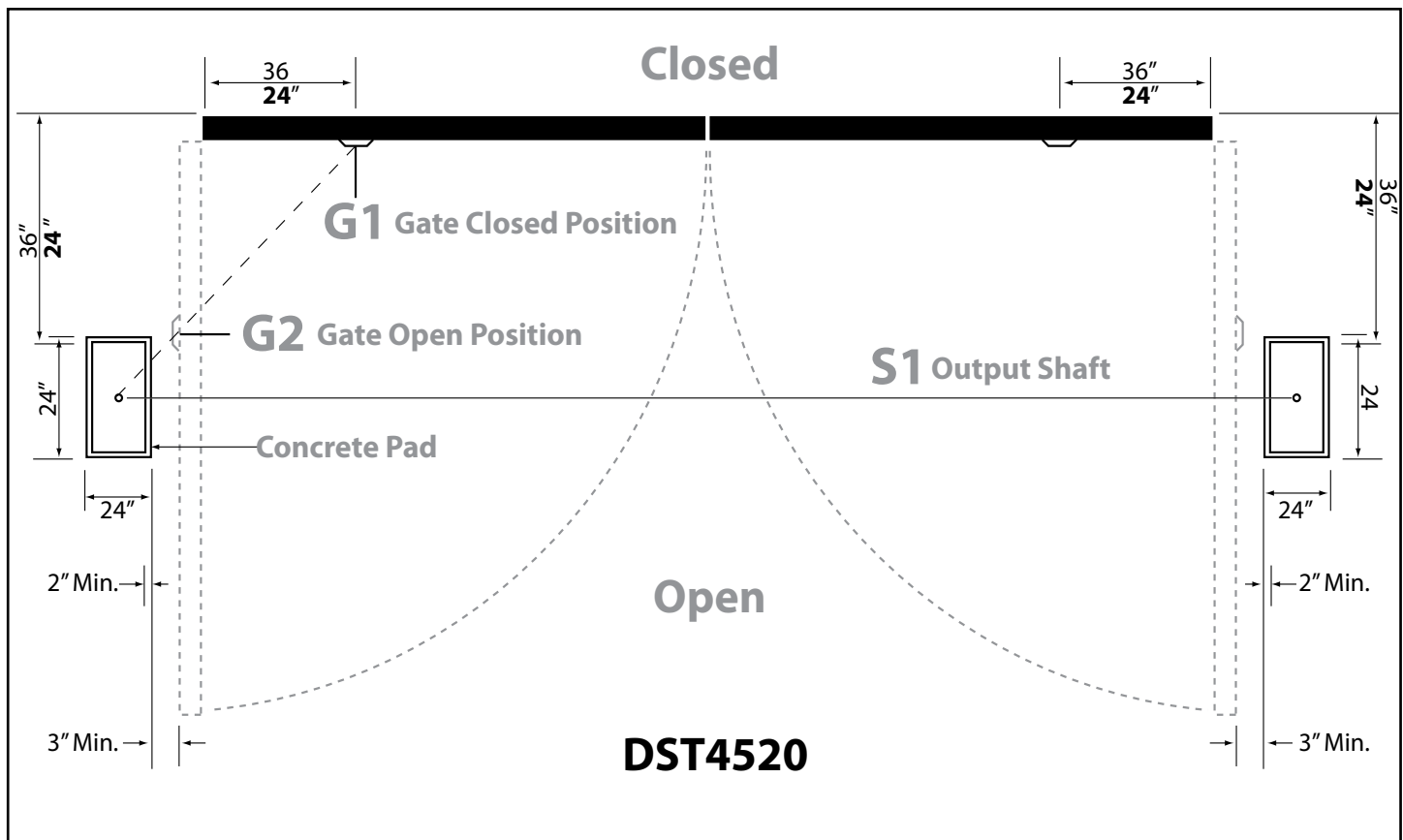


Figure 4

CONCRETE PAD CONSTRUCTION AND LAYOUT

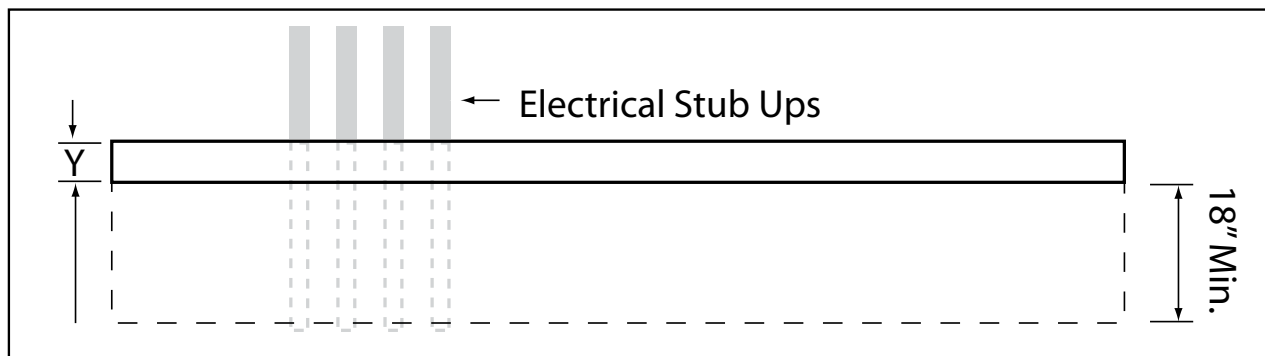


Figure 5 (Side View)

Y dimension in Figure 5 must be high enough so that water will not stand under the operator in a worst case scenario

Soil conditions may vary but in sandy or loose soil the pad should be at least 18"-24" inches deep.

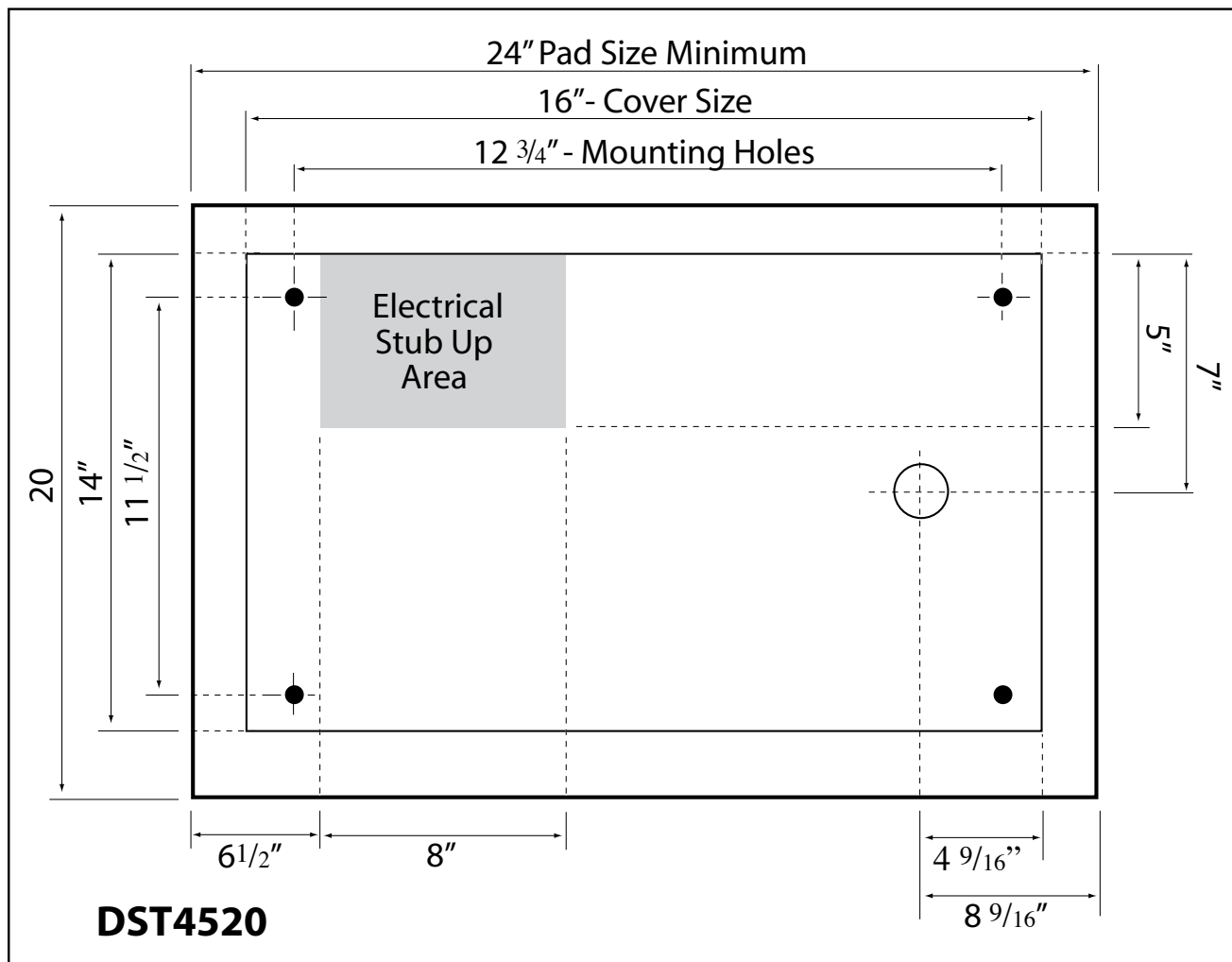


Figure 6 (Top View)

OPERATOR MOUNTING

Locate the operator on the concrete pad per Figure 4 and fasten to the pad using $\frac{3}{8}$ " x $1\frac{1}{8}$ " (or larger) concrete anchors.

UNIVERSAL GATE ARM INSTALLATION GUIDELINES

DS 4020 / DS 4020H / DS 4020HX AND DST 4520

GATE BRACKET

Secure the gate bracket so that the attach hole is 36" to 48" from the hinge point and vertically 20 inches above the top of the pad.

ARM INSTALLATION

Important: Points G1, G2 and S1 must be in a straight line.

The following is applicable to all installations, even if other than 90° operation is required. G1 is the gate attachment point with the gate closed. G2 is the same attach point with the gate fully open. A straight line through those two marks is extended and the S1 (output shaft) of the operator is to be on that extended line.

Note: The operator may be oriented in any position most desirable.

Assemble the swing arm as shown in Figure 8 so that the pipe bracket will pivot to allow the gate to open and close. The swing arm length must be one-half of the distance from G1 (closed position) to G2 (open position).

Important: Lubricate the tapered output shaft and the stainless steel bolt with an anti-seize compound (furnished in kit). Install the arm assembly on the output shaft so that the bevel of the shaft and the arm match. Tighten the stainless steel bolt. It is important that it is sufficiently tight to prevent play between output shaft and the arm

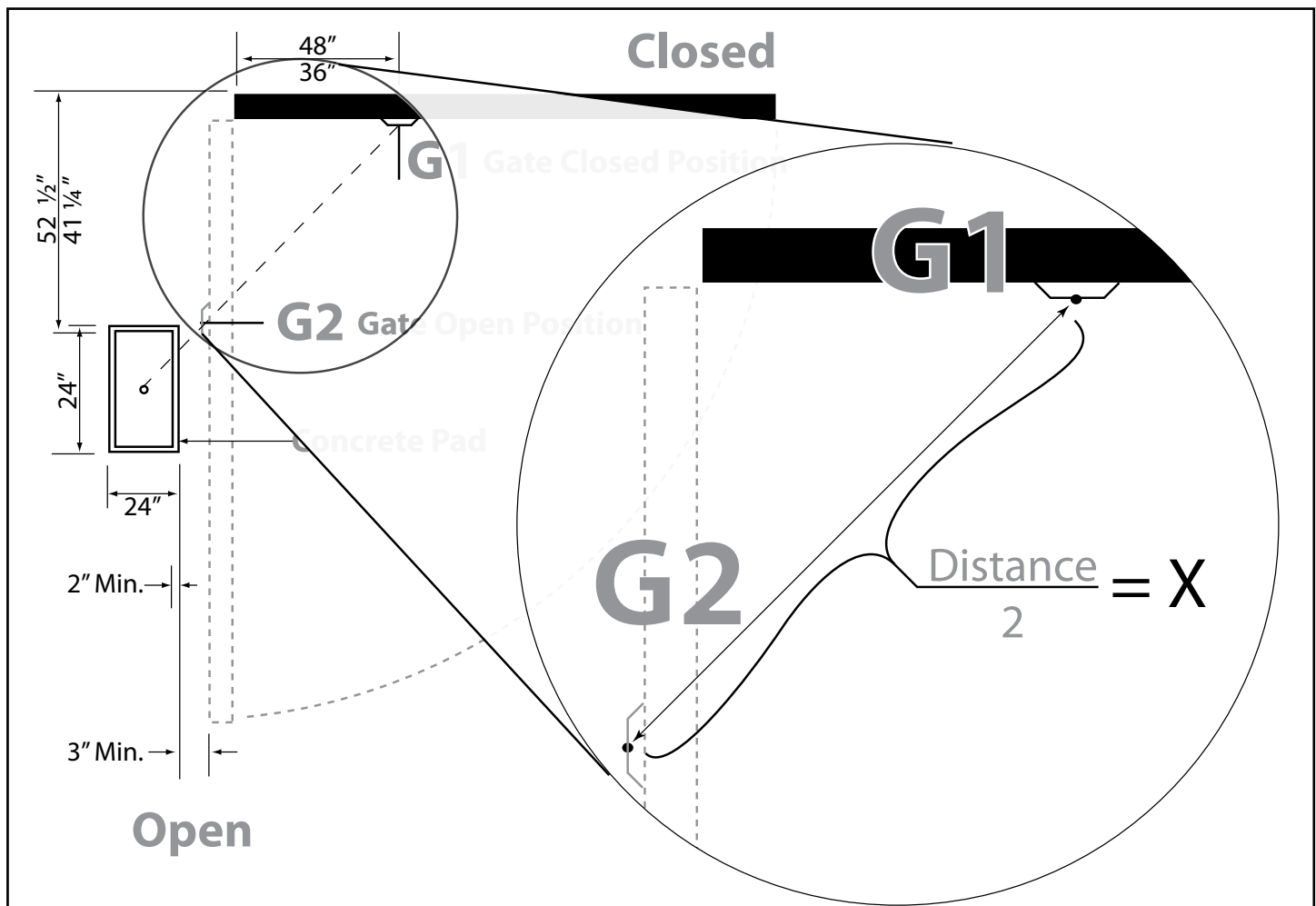


Figure 7

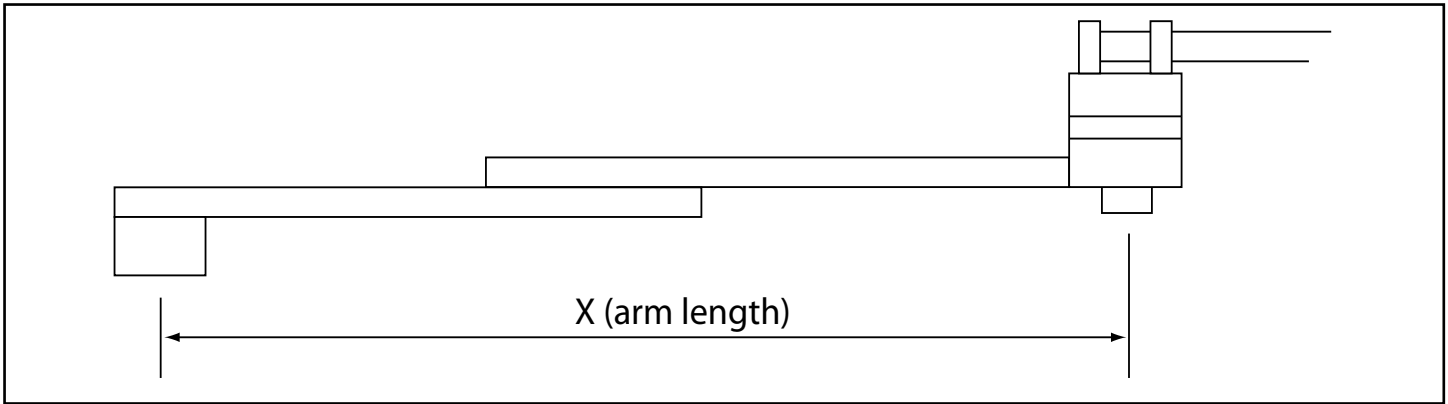


Figure 8 (arm length)

INITIAL LIMIT ADJUSTMENT

1. If you have power to the operator, this step may be accomplished by power before installing the pipe arm. Or with the clutch loose, manually move the arm until it points directly to the hole in the gate bracket with the gate in the closed position.
2. Manually move the arm 180°, in the proper direction, (CW for left hand operator, CCW for a right hand operator). The open limit switch should be actuated.

PIPE CONNECTION

With the gate in the closed position, install the pipe arm to the gate bracket and arm as show in Figure #9.

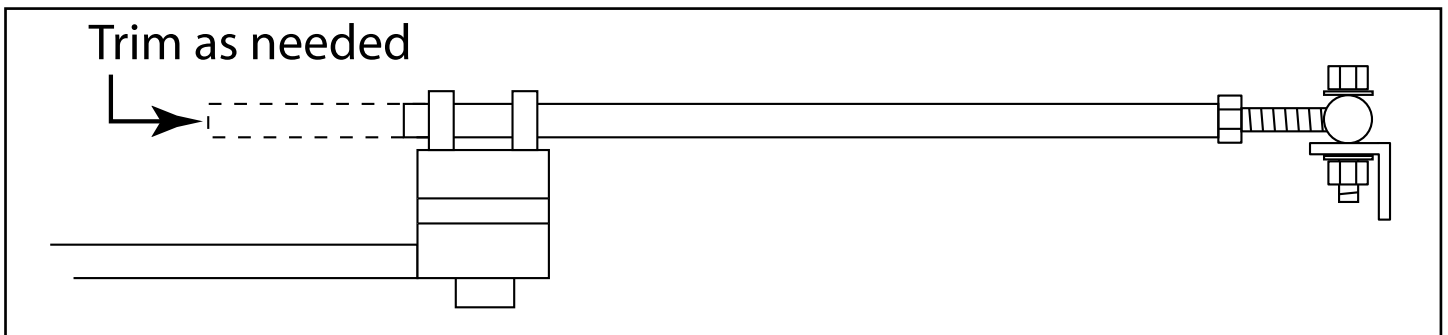
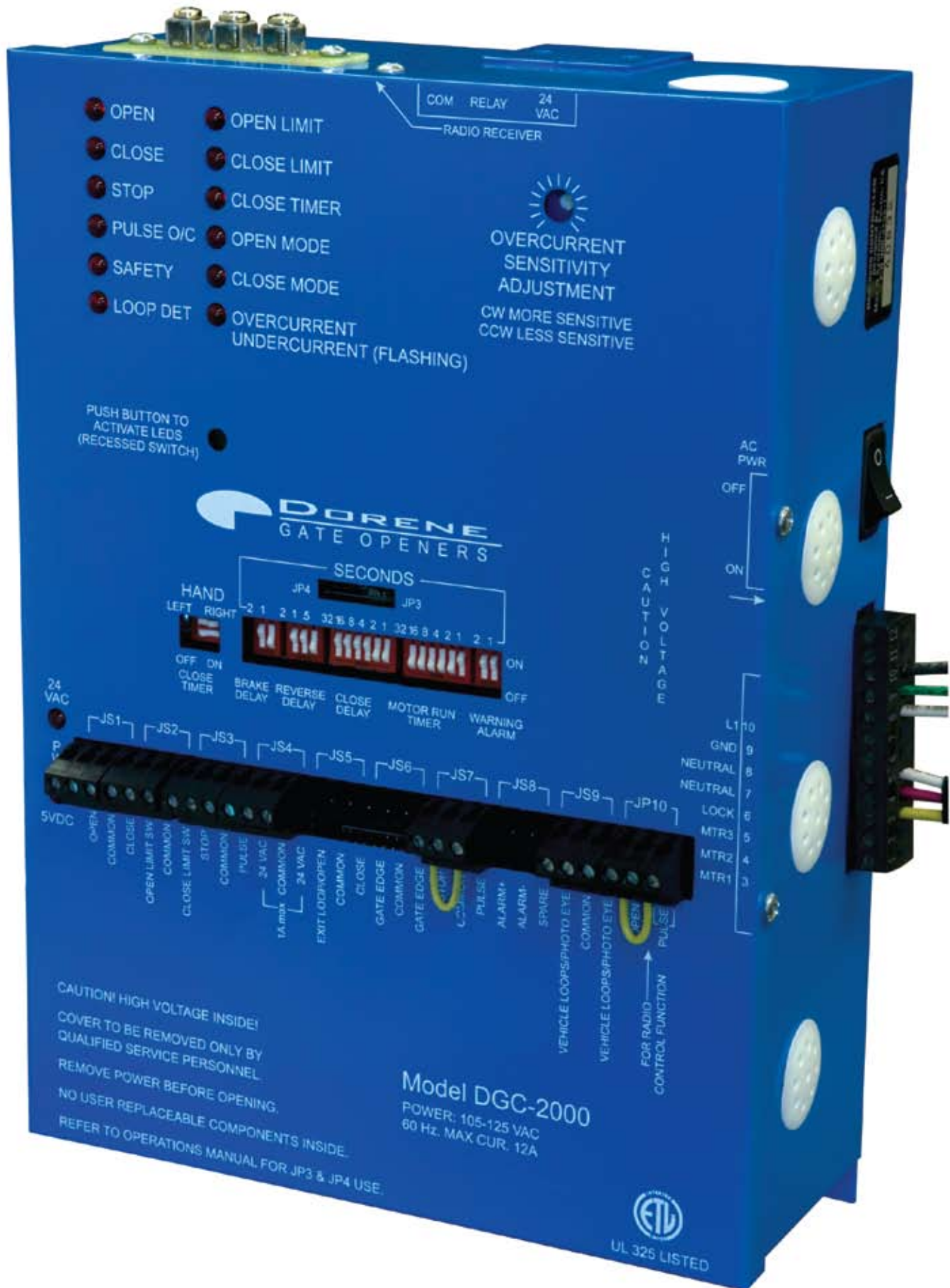


Figure 9 (pipe arm)

Before timing (if needed) the pipe arm, verify that the same pipe arm dimension is valid with both the gate and the operator in both the open and the closed position. If there is a variance, verify previous dimensions to identify and correct the error.

DORENE DGC2000 CONTROLLER



POWER CONNECTION / ELECTRICAL HOOKUP

Important:	Turn power OFF at the breaker before making any connections or adjustments.
Note:	Port 1, 2, 11 and 12 are not to used. They are empty ports. The operator should be on a separate line with a 15 AMP breaker. Supply voltage must be within 10% of the operator rating under load conditions. Connect power in accordance with local codes All operations must be properly grounded with a supply grounding conductor
Note:	Master Slave installations must have the same phase power when separate breakers are used

115 VOLT SINGLE PHASE

See figure 10

#12 OR #14 gauge shielded, standard wire is recommended for the high voltage hoop-ups.

1. Secure the 115 volt single phase HOT line to port #10
2. Secure ground supply line to port #9
3. Secure neutral supply line to port #8

Important: Turn power OFF before making any connections or adjustments.

MAG-LOCK INSTALLATION

If a 115 volt lock is used, connect the neutral wire from the lock to port #7 and the power wire from the lock to port #6

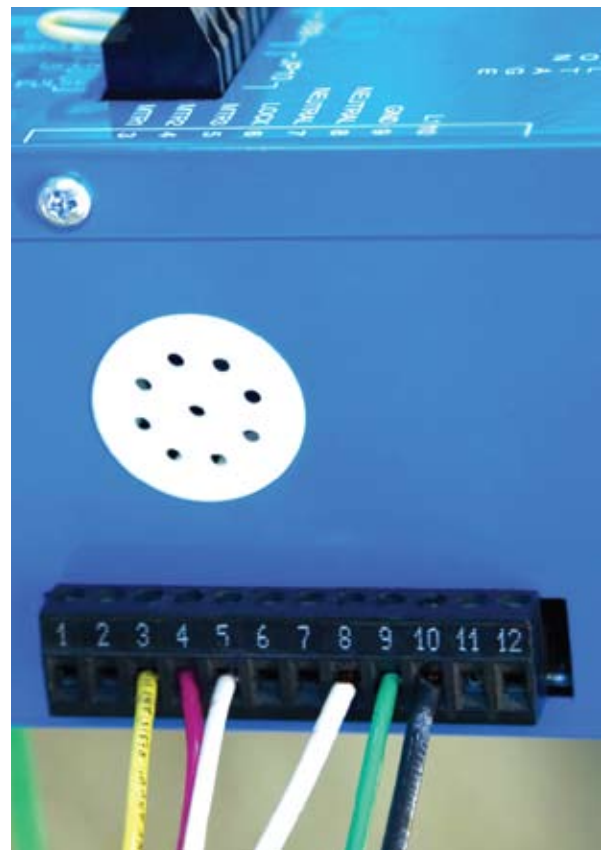
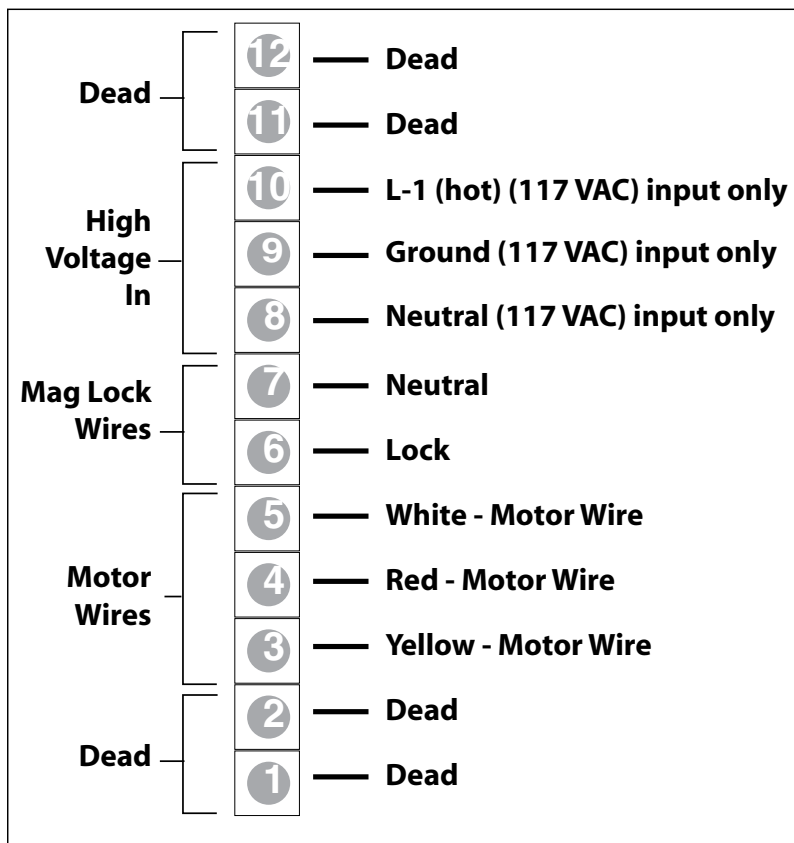


Figure 10 (Power Connection)

CLUTCH ADJUSTMENT

Important: Always turn power off before making any adjustment.

1. Remove the two set screws in the clutch adjuster nut.
2. Using a 1 ¼" Open-end wrench (available at the factory) tighten the clutch adjuster nut until proper tension is achieved. (See Note below) Try just a ¼ turn at a time and then test. **DO NOT USE A PIPE WRENCH OR CHANNEL LOCKS TO ADJUST THE CLUTCH!.**

Important: Do not over tighten the clutch! Gear damage may result voiding the warranty!

Note: The clutch must be sufficiently tight so that it does not slip in normal operation and so that the motor and the current sensor "feel" a load when the gate is obstructed.

3. After the clutch is properly adjusted, with power OFF, tighten the two set screws in the clutch adjuster nut.

FINAL LIMIT ADJUSTMENT

It is possible that a final adjustment may be required for the arm to stop exactly as desired. In the open position, the swing arms and the pipe arm should be doubled on the top of each other. On CLOSE the motor should turn off before the arm hits the stop so that it coasts to the stop. If the operation is not as described, adjust the position of the limit collar to correct the error.

DGC – 2000 CONTROLLER SETTINGS HAND

This switch changes the direction the motor runs to open the gate, left or right

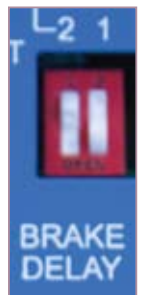
CLOSE TIMER

This switch is used to activate (on) or deactivate (off) the automatic close timer. The gate will close after a specified time as set under Close Delay if this switch is ON unless the gate is being held open by an accessory.



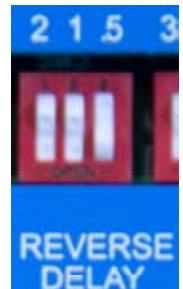
Brake Delay (for slide gates only)

This set of switches determines the length of time between the motor turning off and the electronic brake coming on. All switches should be ON except for a gate on an incline.



REVERSE DELAY

This set of switches is to prevent instant reversal of the motor to reduce operator/gate stress and to prevent operator malfunction. Note: Never put all of these switches in the OFF position as operator damage may result.



CLOSE DELAY

If the close time is switched into the circuit, this set of switches adjusts the length of time the gate stays open before closing automatically. For example, if you want 45 second you would turn on 32+8+4+1=45 as illustrated below in figure 11.

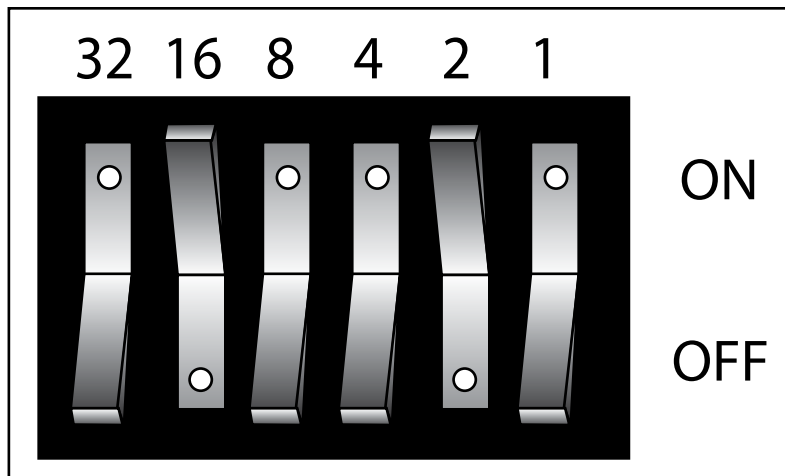
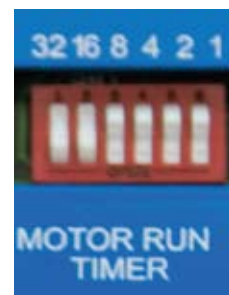


Figure 11



MOTOR RUN TIMER

This timer should be set at least 10 seconds or longer than the normal operating time, and will stop the gate if for some reason the motor runs longer than the switch setting. If this happens the stop LED will flash 3 times then pause, 3 times then pause, it will continue to flash until power has been turned off.



SENSITIVITY ADJUSTMENT

This is used to adjust the current level at which the gate will respond to an obstruction. Turn clock-wise for more sensitive and counter clock-wise for less sensitive.

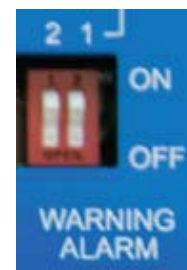
Caution: *The current sense feature is designed only to protect the operator and reduce vehicle damage. It is not intended for pedestrian traffic!*

Note: *The setting must always be sensitive enough to respond to an obstruction, but not so sensitive that it responds without obstruction.*



WARNING ALARM

One to three seconds prior to gate movement.

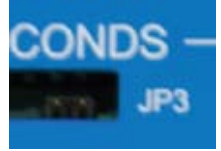


TO HOLD GATE OPEN

Wire switch to stop prior to full open to close reverse switch and press transmitter to restart.

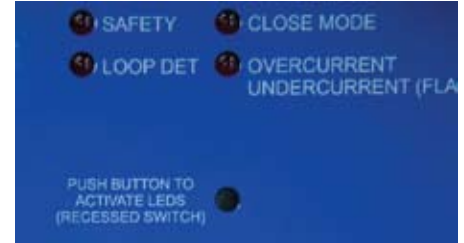
JP-3

Anti-tailgate feature. See Figure #6 on page 11



LED ENABLE SWITCH

The two rows of LED's, located in the upper left hand corner of the DGC 3000, Functions for thirty minutes from power-up and turns off automatically to save power. To verify the LED's are enabled, activate a limit switch momentarily. If the corresponding LED does not light, press the LED enable button, located below the 2 rows of LED's, to turn on the LED's for another 30 minutes.



Safety is for secondary entrapment – devices connected to this terminal will cause the gate to stop and reverse 3". The gate must be activated by a person to move after this has occurred.

Pulse Open/Pulse Close terminal is used to both open and close the gate from a single button. Activation of the button will open the gate unless the gate is fully open in which case it will close the gate.

24V Power terminal is one leg of 24 VAC power (COMMON is the other side of 24 VAC power, and is grounded), which can be used to power a radio receiver, digital keypad or other accessory with 24 VAC voltage requirements.

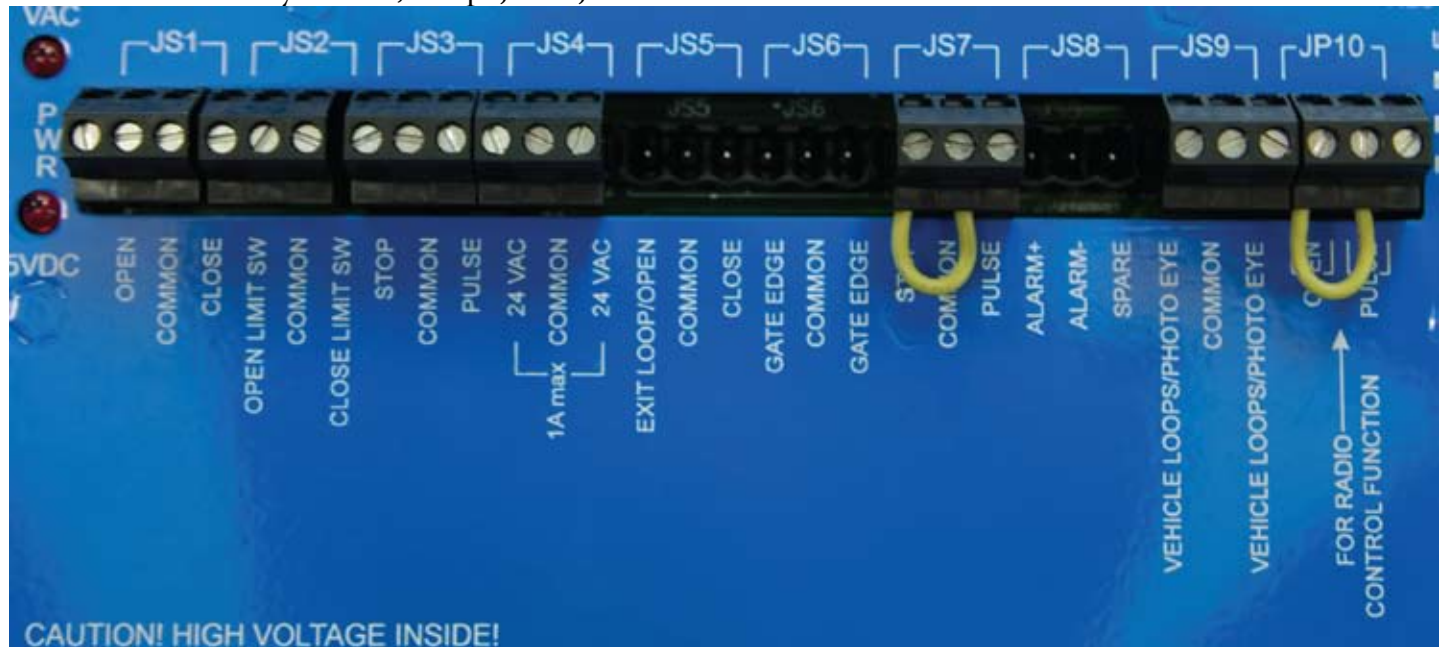
Important: This terminal must not be grounded at any time even through any controls which will be used to activate the gate!

FINAL ASSEMBLY

1. Operate the gate to the middle of its operation and turn power OFF at the breaker (this prevents activation of the operator during final assembly). If preferred, you may turn power OFF and back ON at the operator, the operator will not move until activated.
 2. Remove the arm by removing the stainless steel bolt.
 3. Install the operator cover (make sure the grommet remains properly seated), and re-install the arm as described under ARM INSTALLATION.
 4. Tighten the stainless steel bolt to 44ft./lbs.
 5. The gate operator installation is not complete unless the warning signs are installed on the gate.
-

BLUE BOX FORMAT

All Commands are dry contact, except JS4 & JS8



JS1

Open / Common / Closed. — Dry Contact Command: For Open & Closed gate function, Telephone Entry, Digital Key Pad, Postal Box, etc...

JS2

Limit Switches — Pre-wired, normally a closed circuit

JS3

Stop / Common / Pulse, Stop / Common — Normally a closed circuit, for a stop button on 3 button switch (remove jumper wire on JS7 if JS3 is used) Pulse/Common for use when “close timer is off to open & close gate with transmitter. Must also change JP10 jumper to Common/Pulse

JS4

24V / Common / 24V / 1Amp 24VAC, for use with accessories

JS5

Stop / Common / Close — Same as JS1, good to use for exit loop

JS6

Gate Edge / Common / Gate Edge — 2 wire safety edge input-Gate will stop back 3” & stop has started with a constant transmitter or open command. Also to be used with rear photo eye only.

JS7

Same as JS3 — Jumper wire must be used between Stop / Common in order to work. Pulse / Common for use when “close Timer” is off to Open / Close gate with transmitter. Must also change jumper wire on JP10 to common / pulse.

JS8

+Alarm / -Alarm / Spare — For external alarm prior to gate moving either open or closing.

JS9

Loop Detector-Photo Eye / Common / Loop Detector-Photo Eye — Normally open circuit to connect safety loop and/or photo eyes to operator.

JS10

Open / Common / Pulse — Jumper wire must be used on open / common, it is ready for ready for transmitter / receiver with automatic timing closing. Common / Pulse for use with transmitter open a transmitter closing. No automatic closing

JP3

Jumper across the two pins is for a special brake delay call factory for further details

JP4

Anti tailgate — Jumper on the two pins will stop the gate closing if the safety loop is crossed. The gate will hold in this position until the gate to the full closed position.

SHADOW LOOP INSTALLATION

1. Install a micro switch on top of the open limit switch.
2. Connect the normally open (no) wire from the shadow (center) loop detector to the terminal on the new micro switch.
3. Connect the common wire from the shadow loop detector to the common terminal on JS9 of the DCG2000 Controller box.
4. Add an additional wire from the vehicle loop / photo eye terminal on the DCG2000 Controller

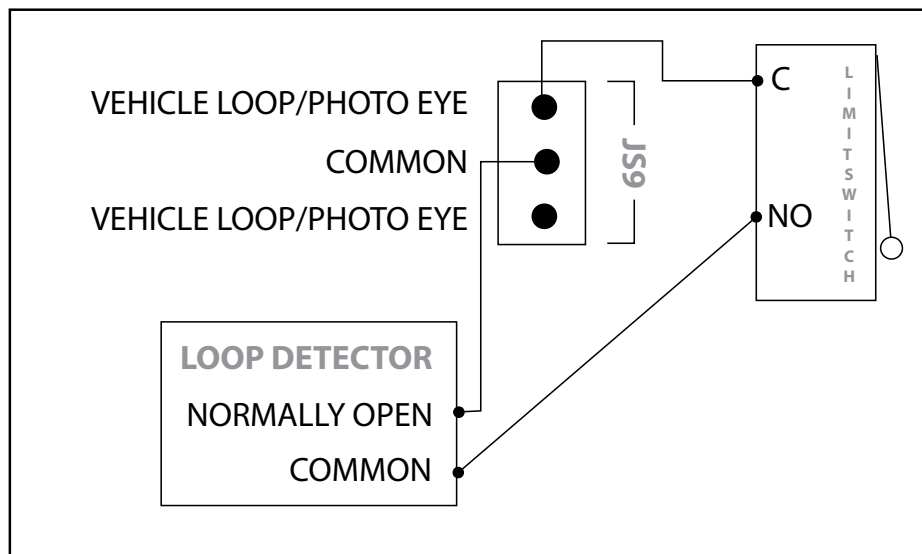
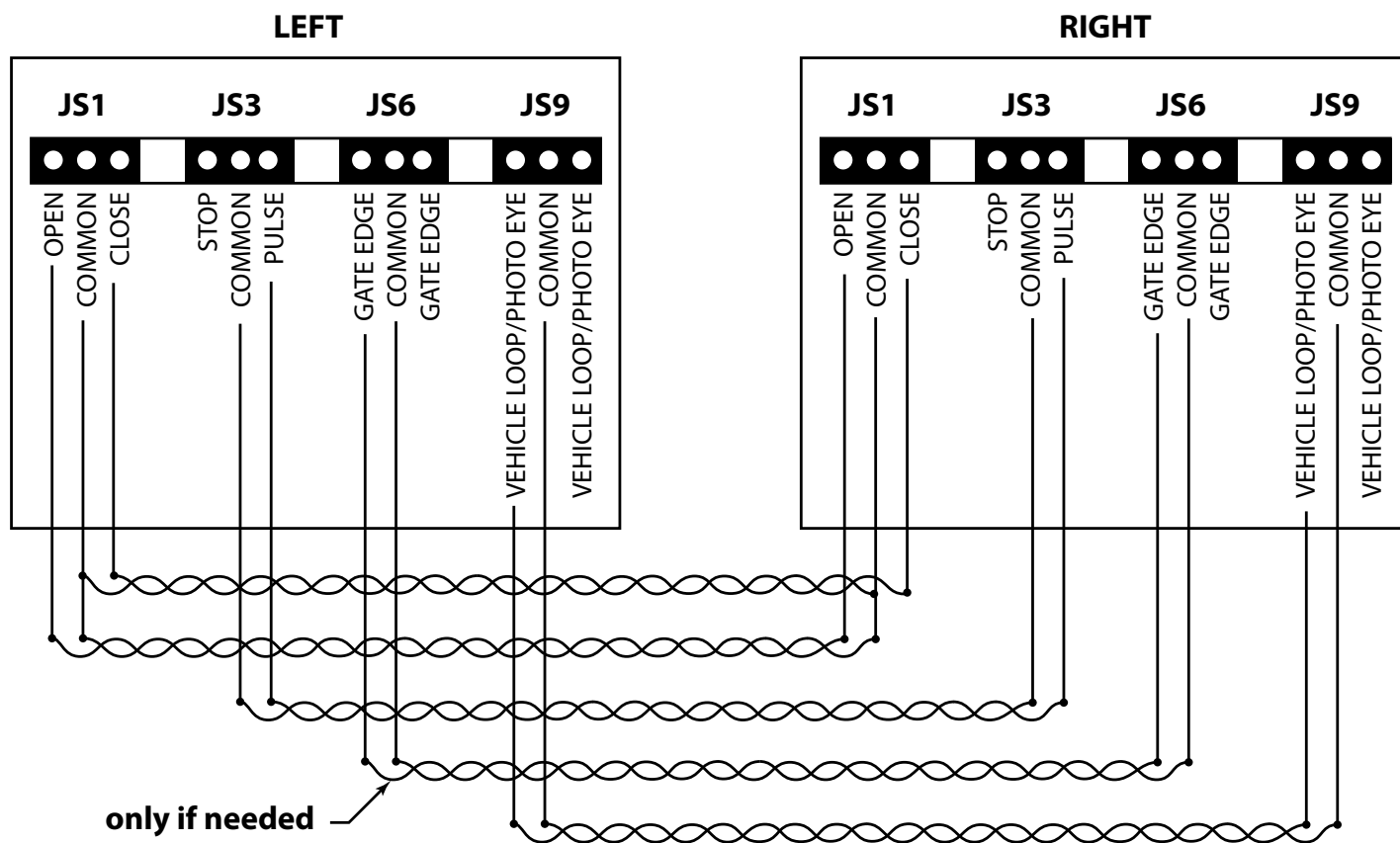


Figure 11

SYNCHRONOUS OPEN/CLOSE OPERATION DGC 2000

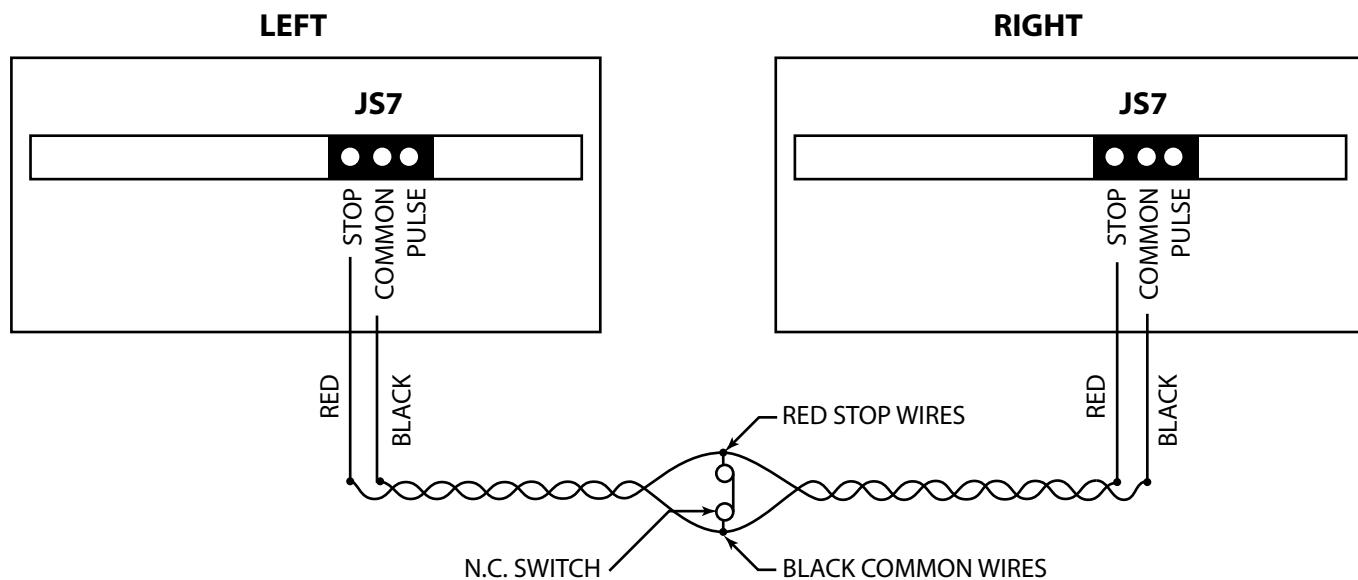


1. Controllers must be operated from same 110v line.
2. Synchronous* Open/Close operation is obtained by installing two twisted pair cables between the JS1 Open/Common and Close/Common connectors of two DGC 2000 controllers.
3. Connection required only with the Gate Edge or other Safety Device.

*Formerly referred to as Master-Slave Operation

Twisted pair cable - Belden P/N 9501

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*Formerly referred to as Master-Slave Operation

Twisted pair cable - Belden P/N 9501

DOUBLE SWING GATE LOOP PLACEMENT

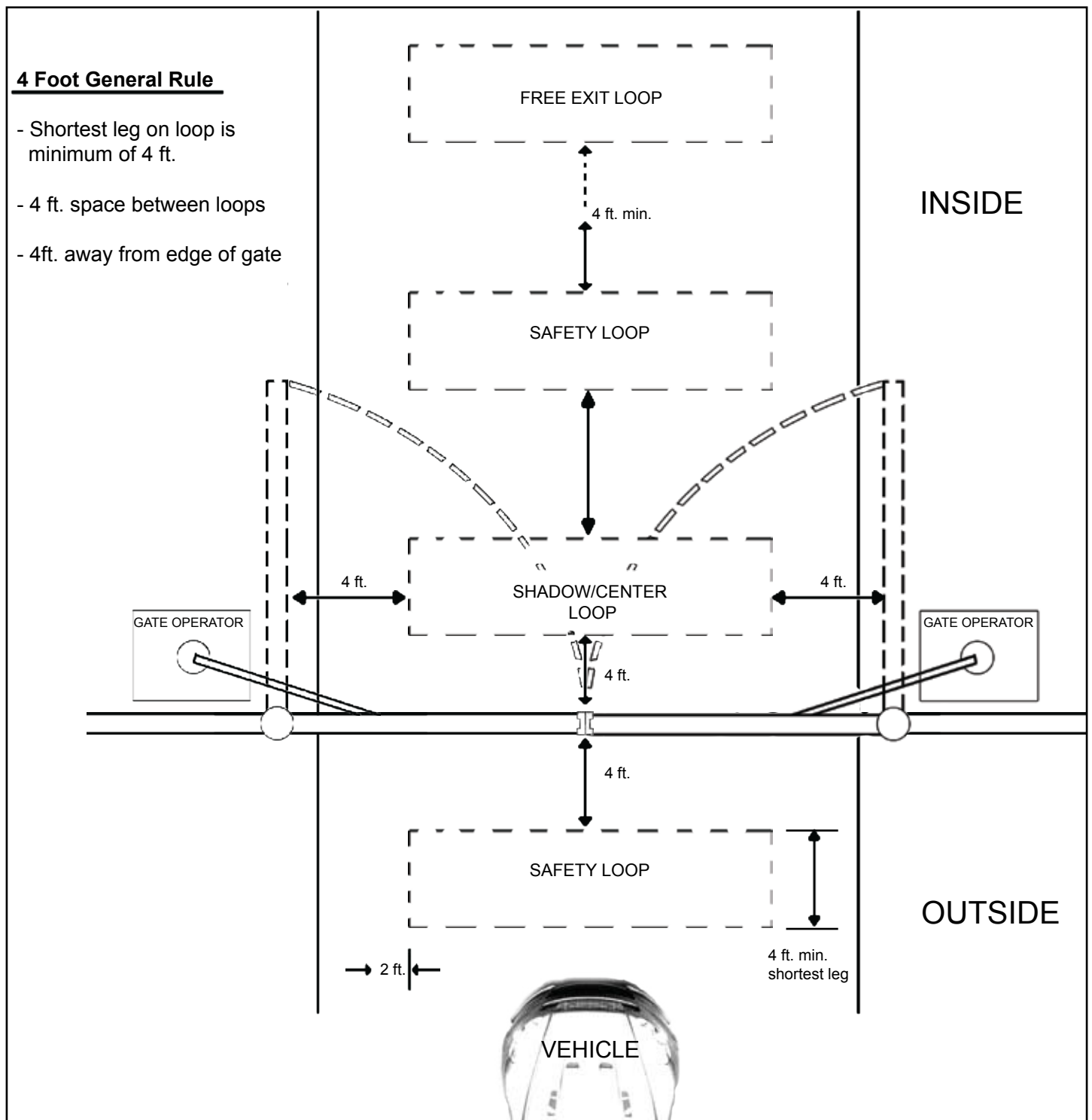


Figure 12

FINAL CHECK

1. Turn power ON at breaker and recheck all functions, including all safety functions.
2. If any adjustments are necessary, make those adjustments and re-test for proper operation.
3. Gate is now ready for normal operation.

Important: The gate operator installation is not complete unless the warning signs are installed on the gate.

MAINTENANCE

1. Severe or excessive usage requires more frequent checks.
2. All safety functions should be verified at least once every three months.
3. The chains should be adjusted and lubed as required at least once every six months.
4. The gearbox level should be checked and filled as required every twelve months.

Note: The proper level is to the bottom of the middle drain hole.

5. The grease fittings should be lubed every twelve months.
-

SAFETY ACCESSORIES

This unit has a current sending feature to reduce vehicle and operator damage. It is not intended for pedestrians and should not be relied upon as a safety device for pedestrians. Other external devices such as electric eyes and gate edges should be used to reduce the possibility of injury to pedestrians. Such devices are available at Dorene, LLC.

INSTALLATION

Dorene, LLC recommends fastening perforated metal to both the gate and related fencing so as to reduce the possibility of injury to persons interfering with the gate operation. It is also recommended to add fencing to prevent persons from entering the gate and operator operating areas. Never install any accessory in any location, which if accessed from the opposite side from that intended might increase the risk of personal injury.

TESTING

All safety devices should be checked at least once a month and at least once every three months by a unqualified service technician. Never leave a gate operating if any safety device is not functioning properly. Please call Dorene, LLC if you have any questions about this operator, its functioning or proper safety devices.

WARNING

To reduce the risk of injury to persons, use this operator only with rolling gates.

CAUTION

To reduce the risk of injury to person, operate gate only when fully visible, properly adjusted and free of obstructions. Do not permit children to play in the area of the gate.

TROUBLESHOOTING

To trouble shoot the gate operator it is important to understand how the LED's function work.

Note: The power LED functions all the time that power get to the DGC 2000 Controller box. The LED's function for thirty minutes from power-up and go off automatically to save power. To verify that the LED's are enabled, activate a limit switch momentarily. If the corresponding LED does not light, press the LED enable switch, located below the LED's to enable them for another thirty minutes.

Troubleshooting Assumes the following: (which are not necessarily true):

There is 115v AC power to L-1 and neutral at the high voltage terminal.

The LED's have been enabled (press the LED enable switch if necessary)

All external controls are connected.

There are no loose or "bad" connections.

If an LED is indicating a possible cause to the malfunction, that problem is dealt with first.

THE LEFT LED'S

OPEN, CLOSE, STOP, PULSE O/C, SAFETY indicate what external inputs are being activated. If the gate is stuck open or closed, first verify that one of those LED's is not on, indicating that an accessory is holding it in that position.

Note: The STOP LED will continuously flash three times and pause after the motor has run longer the setting on the motor run timer. The operator will not function again until power has been removed and re-applied. It is important to determine the cause of this and correct the problem before putting the unit back into operation.

THE RIGHT LED'S

OPEN LIMIT, CLOSE LIMIT, CLOSE TIMER, OPEN MODE, and CLOSE Mode indicate what operator functions are taking place. The OVER CURRENT LED lights when the current sensor activates and stays on until another input of action takes place. This LED can also light if no current is sensed for 15 seconds while the motor is "being told" to run. Also if, for example, the OPEN LIMIT LED is lit while the open limit switch is not activated, check for a defective switch. Flashing OVER CURRENT LED indicated low voltage situation.

GATE WILL NOT OPEN OR OPERATE	
No LED's are on	
Cause	Solution
No power between L1 and Neutral with power switch on	Check connection from power supply
	Check wiring from high voltage terminal to power plug. Replace as necessary
	If problem can't be corrected, you may need to replace the controller
No power between L-1 and Neutral with power switch off	Check connection from high voltage plug to controller
	Check wiring from high voltage terminal to power plug. Replace as necessary.



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