

# Swing Gate Operator

## User's Manual

**Model: ZK1800**

**WARNING!**

ONLY QUALIFIED AND EXPERIENCED TECHNICIANS SHOULD ATTEMPT INSTALLATION OR SERVICE TO THIS UNIT, OTHERWISE, SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE MAY OCCUR. PLEASE KEEP THESE INSTRUCTIONS FOR FURTHER REFERENCE.

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## 1. Important Safety Information



Read the entire user's manual before beginning installation, and carefully obey the following instructions:

- The gate operator should be installed by a qualified technician. DO NOT in any way modify the components of the gate operator, otherwise, serious personal injury or property damage may occur.
- To prevent the risk of electrocution, be sure to turn off all power to the ZK1800 until installation is complete.
- The operator should be switched off before repairing it or opening its cover.
- When opening or closing the gate, do not attempt to walk or drive through the gate. Do not touch the gate while in operation.
- The auto-reverse function must be checked during installation to ensure that the gate can auto-reverse in the event of obstruction.
- This auto-reverse function should be regularly inspected and adjusted, if necessary.
- Children should not be allowed to play near or operate automatic gates.
- Keep the remote control away from children.
- The automatic gate operator must be grounded.
- Be careful when in close proximity to moving parts where hands or fingers could be pinched.
- Do not allow control devices to be placed so that a person can access them by reaching through the gate.
- Never active your gate operator until you ensure that the area is clear of people, pets or other obstructions.
- The entrance is for vehicles only. Pedestrians must use a separate entrance.
- Our company reserves the right to change the design and specification without prior notification.

Failure to comply with the instructions above may result in personal injury or property damage. Our company does not accept responsibility for damage or injury resulting from installing this operator.

## 2. Additional Features

- Use this operator with single or double swing gates.
- Supports gate leafs up to 280kg and 3m.
- Supports up to 25 RF remotes, 2 included.
- User programmable and user erasable remote codes.
- RF hopping code technology prevents your remote code being accessible to others.
- For your safety, the ZK1800 will stop and reverse if it encounters an obstruction during closing and stop when it encounters an obstruction during opening.
- Manual key release design for emergency purposes.

## 3. Specifications

Table 1 Technical data

Power supply	AC220x(1±10%)V, 50Hz
Rated force	1800N
Maximum force	3000N
Working angle of gate	90° or 105°
Max. gate section weight	617 lbs. (280kg)
Max. gate section width	9.8 feet (3 meters)
90° opening or closing time (one gate leaf)	18 seconds
Cycles per hour (20° C)	≤ 15
Motor thermal protection	120° C
Ambient temperature	-20° C~+50° C

## 4. Necessary Tools

The following tools may be necessary to install the ZK1800 operator. You will need an electric drill, hacksaw, screwdrivers, tape measure, level, wire cutters and wire stripper, a socket set, and possibly access to a welder if your installation cannot use the supplied brackets. If the brackets shipped do not fit your gate because of the dimensions of your gate, you may have to fabricate brackets for your application or notch a column in order to obtain the necessary set back.

## 5. Site Preparation

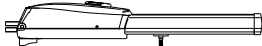






Before you begin the operator installation, make sure the following conditions are observed:

- The gate and post must be suitable for being automated.
- Check that the structure is sufficiently strong and rigid, the operator must operate on a reinforced point on the gate and that its dimensions and weights conform to those listed in the specifications of this document.
- The gate should be mounted to the fence post and swinging freely, there should be little resistance in the swing of the gate.
- Make sure that the gate is plumb and level.
- The fence posts must be mounted in concrete.
- If you want to use electric lock, make sure the bottom of the gate is 45-50mm from the ground. If the electric lock is not required, make sure the distance from the bottom of the gate to the ground more than 20mm.

## 6. Packing List

After receiving the product, you should make an unpack-inspection, in which you should check whether the product was damaged. If you have any problem please contact dealer.

Table 2 Packing List of ZK1800 Swing Gate Operator

Item	Diagram		Quantity		Remark
			For one gate leaf	For two gate leaves	
Operator			1	2	
Post bracket			1	2	
Gate bracket			1	2	
Control box +2 remotes			1	1	
Stop block			1	2	Optional
Electric Lock			1	1	Optional
Base plate			1	1	Optional
Accessories	Pin	For mounting post bracket	1	2	In the same plastic bag.
	Circlip		1	2	
	Nut	For mounting gate bracket	1	2	
	Spring washer		1	2	
User's manual			1	1	

## 7. Mechanical / Installation

Begin with both operators unlocked. Next identify if this will be a “push to open” or a “pull to open” installation. In either configuration, the gate is mounted on one face of the mounting post, and the operator is mounted on the face 90 degrees from it. Below are schematics of both “push to open” and “pull to open” configurations.

As shown in the diagram below, correctly mounting geometry assures that the desired degrees of swing are achieved, that the gate speed is correct, and that the operator and gate will operate properly and have a long life.

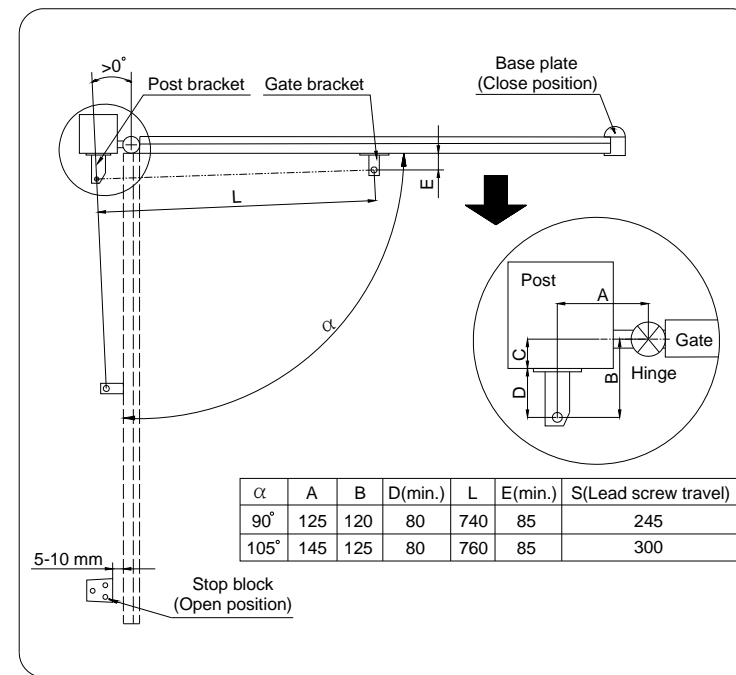


Fig.1 Pull to open mounting geometry

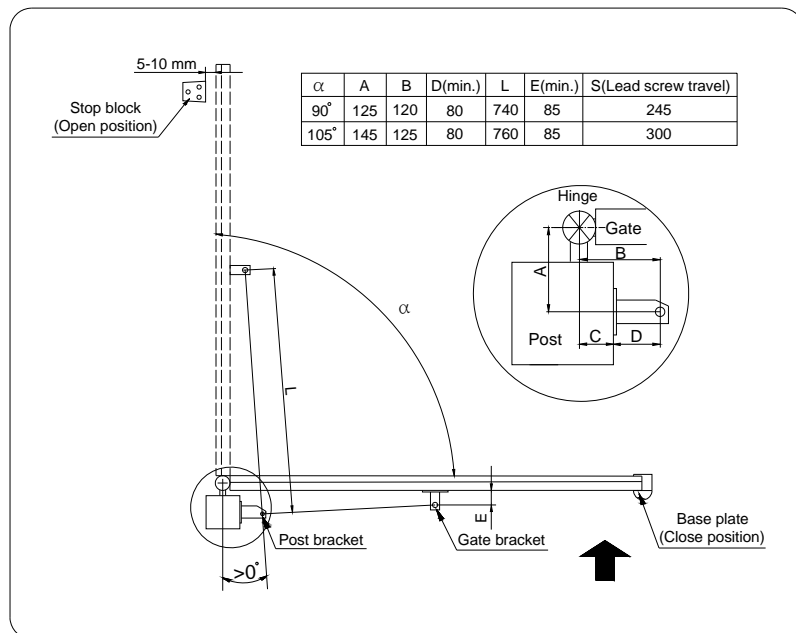


Fig.2 Push to open mounting geometry

Main structure and dimension (see Fig.3 and Fig.4)

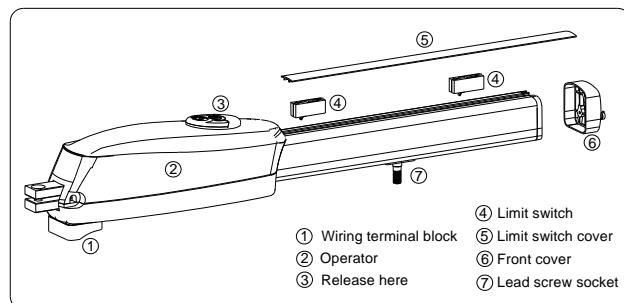


Fig.3

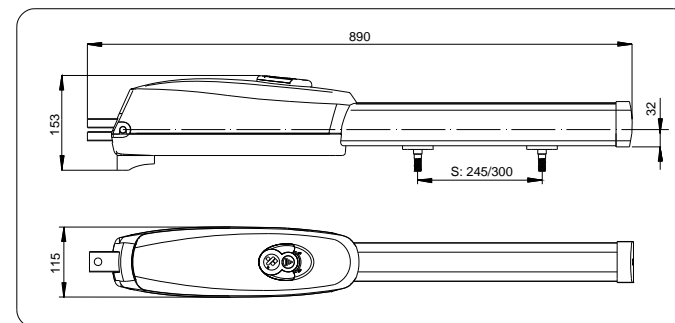


Fig.4

Installed automatic gate operator (see Fig.5)

Locate the gate operator between the two hinges, the installation height range is 300 – 800mm. this will prevent the gate from twisting and flexing. Add a cross bar on the gate if necessary.

Note: If the operator is mounted at a height above the specified range, and the gate is not sturdy enough, then it may result in bending or damage to the gate and gate operator.

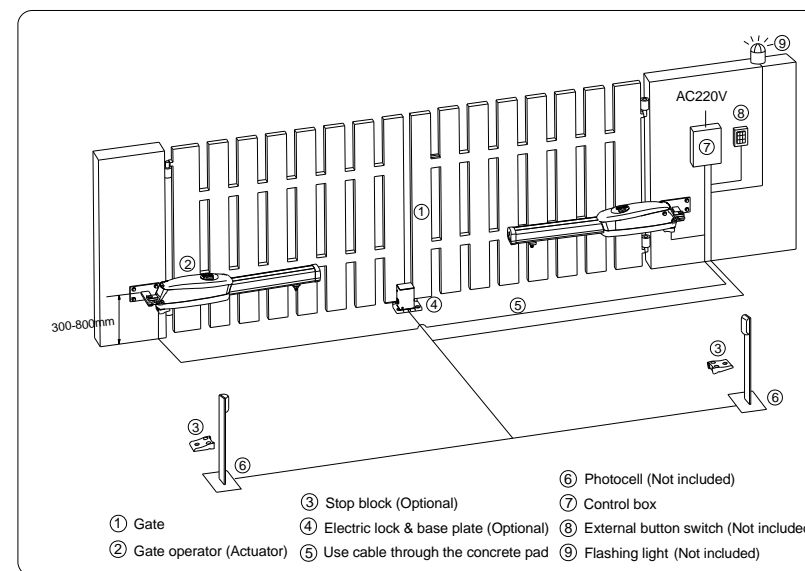


Fig.5

Rear parts of gate operator

- Fix the post bracket on the cement pillar with screws and spacers (or welding for metal pillar). Make sure that the bracket is plumb and lever.
- Mount the rear part of the gate operator on the post bracket using the pin supplied, secure the pin using the circlip. See Fig. 6.
- The bracket installation should meet the specifications as shown in figure 1-2.

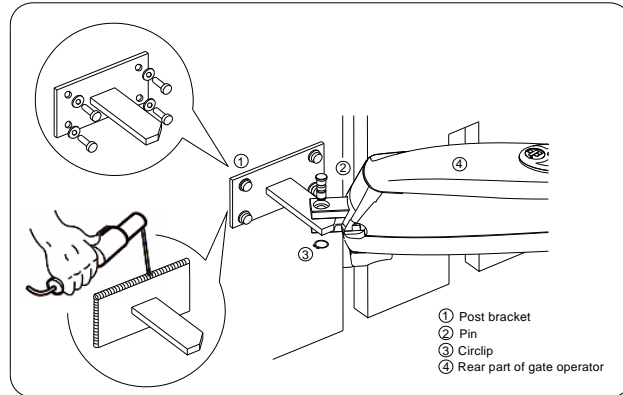


Fig.6

Front parts of gate operator

- Install the gate bracket on to the front part of gate operator using the nut and washer.
- Release the gate operator, with the gate in open position, tack weld the gate bracket on the gate, and use a level to check the flatness of the operator. See Fig.7 and Fig.8. The bracket installation should meet the specifications as shown in figure 1-2.
- Open and close the gate manually, performing complete opening and closing travel. Movement must be smooth and the lead screw socket, should not reach the mechanical stop.
- If this is not the case, review bracket positioning and that its dimensions conform to those listed in the specifications of this document.
- After you have identified the desired position of the bracket, remove the gate operator and permanently weld the gate bracket top, bottom and sides.
- Install the gate operator.

**Caution: welding with operator in place may damage the operator.**

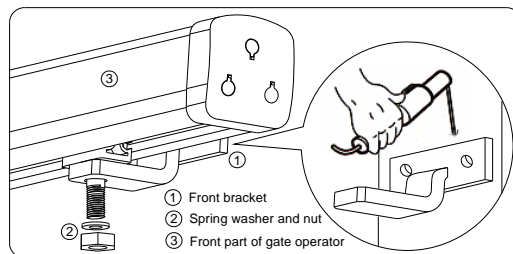


Fig.7

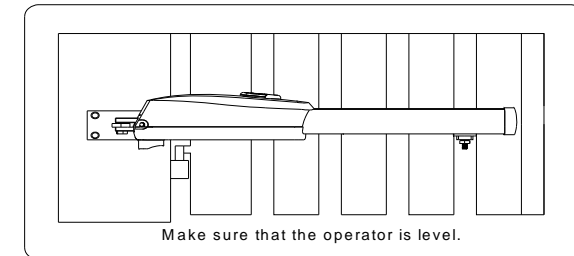


Fig. 8

Stop block –open position

- After the gate reaches the desired angle ( $90^\circ$  or  $105^\circ$ ), ensure 5-10mm space exists between the gate and stop block. See Fig.1 or Fig.2. This margin is required to prevent the gate from bumping on the stop block.
- Fix the stop block to the ground with expansion bolts, add pad if necessary.
- After mounting the operator, with the key unlocked, move the gate, verify that it stops at the proper position.

Electric lock

- An electric lock is provided for installation for gate lengths greater than 1.5 meters.
- To install the base plate of the lock, place the base plate between the two gates, determine the location, mark and drill the holes.
- Fix the base plate to the ground with 3 screws, make sure the gate is higher than base plate and that the lock pin can fit tightly in the hole in the plate.
- Weld the steel plate of the lock to the primary gate, and then fix the lock to the steel plate. See Fig.9 to determine the height of the electric lock.

Stop plate (see Fig.9)

- The pair of gate sections will not start simultaneously. The gate section with the lock will start to open earlier than the other gate section, so that both sections can be locked properly.
- With the gate in the desired closed position.
- Weld a stop plate on the gate section without the lock.
- A plate or tab can be welded on the gate section with the lock so that when it closes, it will trap the gate section without the lock between itself and the base plate, thus locking both gate sections.

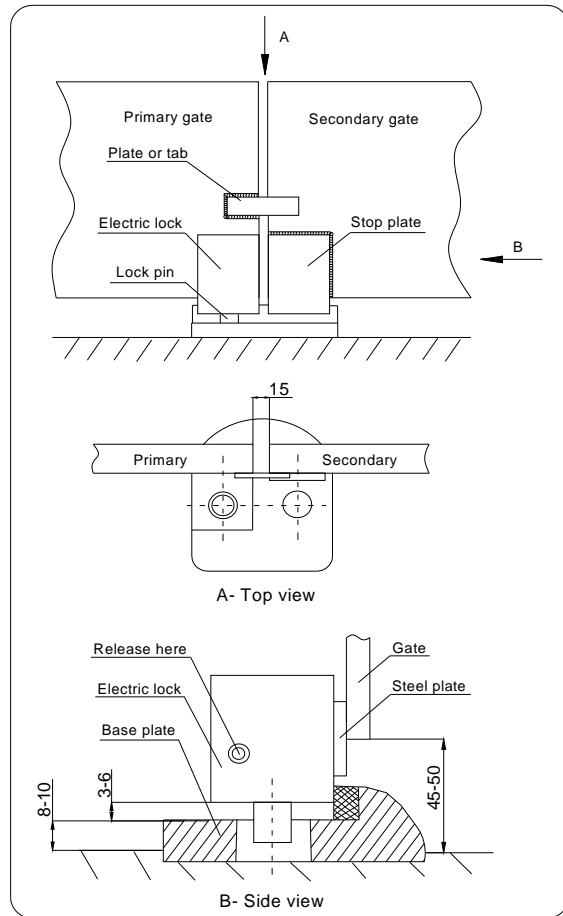


Fig.9

## 8. Mechanical / Adjustment

### Limit switch (see Fig.11)

- Limit switches are needed to stop the gate at the correct open and closed positions.
- Isolate the power supply to the system.
- Back off the screw retaining the front cover, remove the front cover. Slide out the aluminium limit switch cover. See Fig.10
- Release the operator by turning the key 180° clockwise, manually close the gate to fully closed position.
- Slacken and then press down the screw locking the close limit switch by a screwdriver.

- Move the close limit switch into the required position and tighten the limit switch lock screw.
- Manually open the gate to fully open position.
- Slacken and then press down the screw locking the open limit switch by a screwdriver.
- Move the open limit switch into the required position and tighten the limit switch lock screw.

### NOTE:

Move the open limit switch to right to open more, move the open limit switch to left to open less.

Move the close limit switch to right to close less, move the close limit switch to left to close more.

After limit switch adjustment, with power on, you can open the gate then close the gate and observe whether the gate has successfully reached the open and closed positions. If the gate does not reach the desired position, readjust the limit switch to suit the desired distance, the process is the same as the adjusting as above.

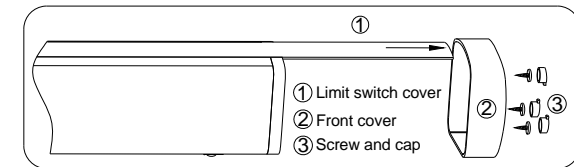


Fig.10

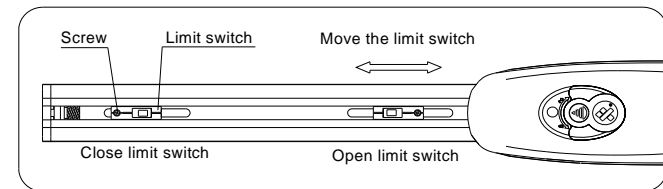


Fig.11

### Mechanical stop

Move the gate to fully open and closed position, slacken the screws on the mechanical stop, move the mechanical stop to proper position until the stop is 10-20mm from the lead screw socket, tighten the screws. See Fig.12

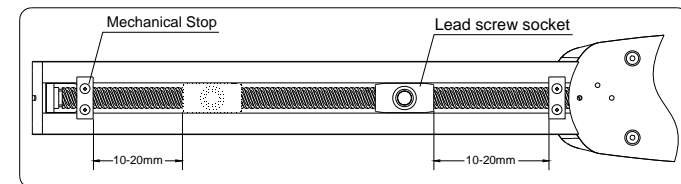


Fig.12

**Manual operation** (see Fig.13)

- If a power failure or a malfunction occurs the gate can be operated manually by releasing the operator to manual operation.
- Move the protection tab, insert the key supplied into the lock.
- Rotate the key clockwise by 180° to release the operator, open and close the gate manually.
- Reverse these steps when engage the operator.

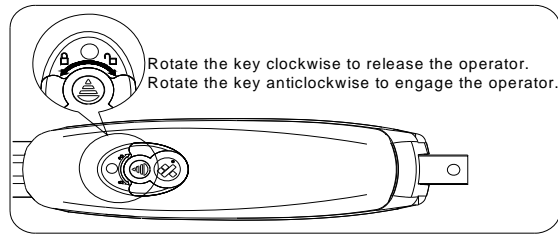


Fig.13

**9. Electrical / Control Box Mounting****Install the cable**

- In order to protect the wires, between the gate operator and the control box, armored cable, galvanized cable or PVC conduit must be set into the concrete when it is poured. To prevent rainwater from entering into the cable, arrange the cable as show in Fig.14-A.
- Wires within the cable shall be located or protected so that no damage can result from contact with any rough or sharp part.
- The diameter of the cable must be more than 20mm, motor wire should be 0.75mm<sup>2</sup>, earth wire should be 1.0 mm<sup>2</sup>, and limit switch wire should be 0.3 mm<sup>2</sup>.
- Use another cable for safety devices (such as electric lock, infrared photocell, flashing light, external button switch etc.), the wire size should be more than 0.5 mm<sup>2</sup>.

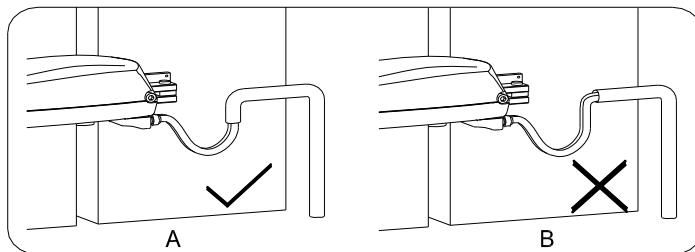


Fig.14

**Install the control box**

- The control box circuit should be equipped with breaker (10A).
- Make sure that power is OFF before making any electrical connections.
- Place the control box in the desired mounting position, open the cover of the control box, remove the control board, mark the mounting holes, and install the control box, fix the control board back to the box. See Fig.15
- Perform the wiring.

**Note:** we regard the gate with the electrical lock as the primary gate, the other gate as the secondary gate.

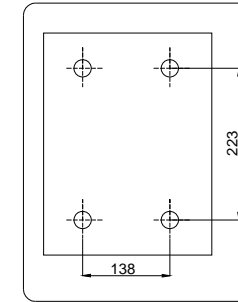


Fig.15 Control box mounting size

**10. Electrical / Main Terminal Wiring**

**Note:** following is wiring of 'pull to open' configurations. For 'push to open', please exchange the motor wires 'V1' and 'W1', 'V2' and 'W2', exchange the limit switch wires 'OP1' and 'CL1', 'OP2' and 'CL2'.

**Connecting**

Open the wiring terminal block cover, connect the gate operator to the control box as shown in table 3 and Fig.16, ensure that the wires and terminals match colors.

In order to prevent rainwater from entering main unit, remember to bend the cables downwards as show in Fig.17.

Table 3

Primary operator	E	U	V	W	CL	COM	OP
Colour	Yellow & Green	Blue	Brown	Black	Red	White	Green
Control board	E	U1	V1	W1	CL1	COM	OP1
Secondary operator	E	U	V	W	CL	COM	OP
Colour	Yellow & Green	Blue	Brown	Black	Red	White	Green
Control board	E	U2	V2	W2	CL2	COM	OP2

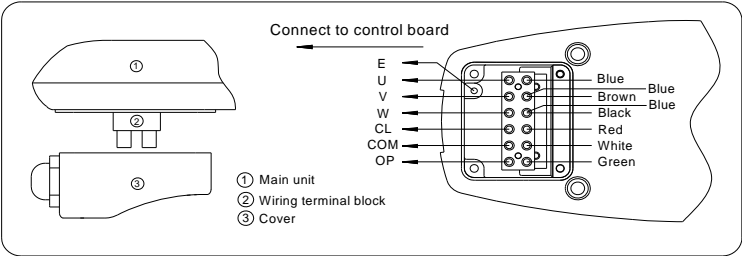


Fig.16

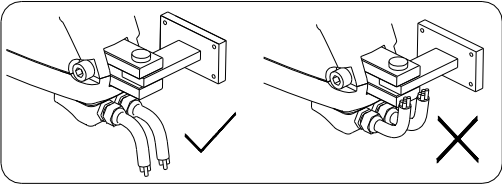


Fig.17

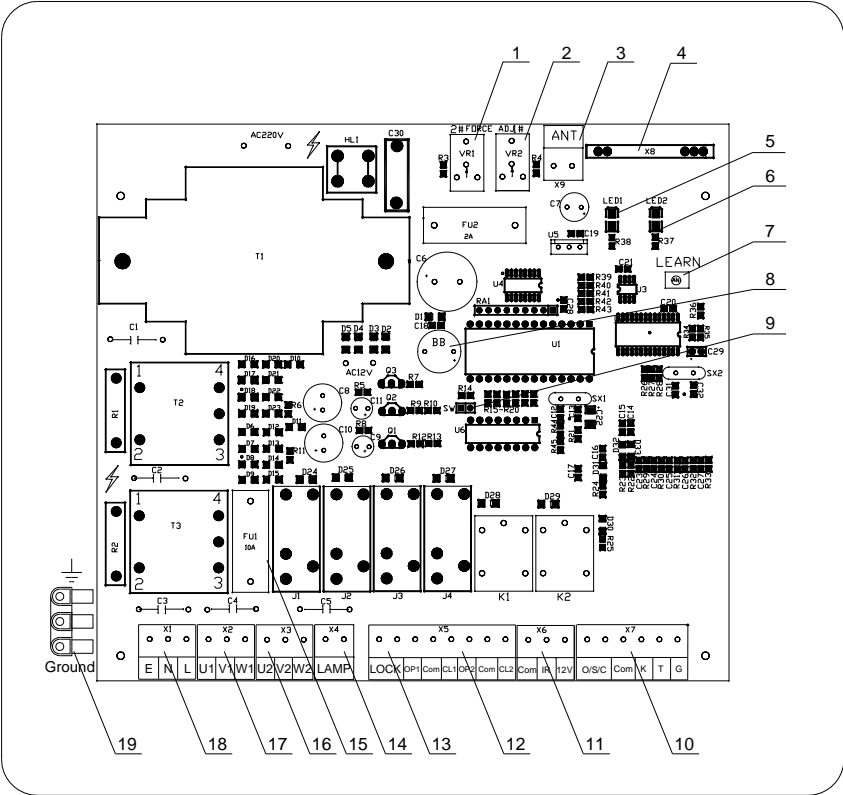


Fig.18 Control board diagram



Table 4 Wiring notes of control board

Position	Function	Remark
1	Force adjustor (for secondary gate-leaf)	The resistance may be increased or decreased by rotating clockwise or anticlockwise.
2	Force adjustor (for primary gate-leaf with electrical lock)	The resistance may be increased or decreased by rotating clockwise or anticlockwise.
3	Antenna	
4	Receiver panel	
5	Power indicator light (LED1)	1206 red
6	Learn indicated light (LED2)	1206 green
7	Learn button	6 mm x 6 mm
8	Beeper	DC12V
9	Set auto close function (SW)	
10	External button switch/keypad interface	Connect external button switch/keypad
11	Infrared photocell	Normally open (12V)
12	Limit switch	Normally open
13	Electric lock	DC12V
14	Flashing light	AC220V
15	Fuse	5x20 10A
16	Secondary motor (for secondary	
17	Primary motor (for primary gate-leaf	
18	Power supply	AC220V
19	Ground	

**Power** (see Fig.19)

Wire a standard grounded plug to your control board using standard electricians wiring practices. Wire the opposite end of this cable to the 'E', 'N', 'L' contacts of the control board. Connect L to the power line, N to the neutral line, and E to the ground line.

**Motor** (see Fig.19)

Connect primary motor that on the primary gate (with electric lock) to 'U1', 'V1', 'W1'. Connect secondary motor to 'U2', 'V2' and 'W2'.

**Flashing light (AC220V)**

Attach two wires of flashing light to port 'LAMP'. See Fig.19

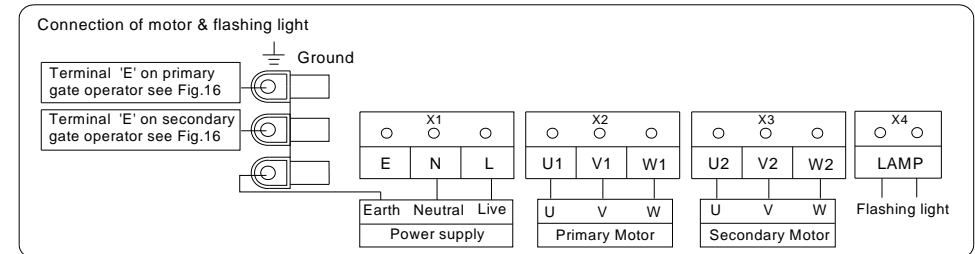


Fig.19

**Electric lock (DC12V)**

Connect two wires of electric lock to port 'LOCK'. Wire size should be more than 1.5mm<sup>2</sup>. see Fig.20

**Limit switch** (see Fig.20)

Connect primary limit switch that on primary gate operator (installed on primary gate with electric lock) to port 'OP1', 'COM', 'CL1'.

Connect secondary limit switch to port 'OP2', 'COM', 'CL2'.

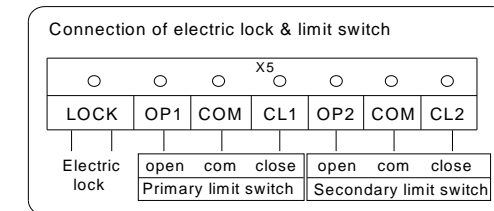


Fig.20

**Note:** Use operator with single gate, connect motor to 'U1', 'V1', 'W1', connect limit switch to 'OP1', 'COM', 'CL1', it is important to short the 'OP2' and 'COM', 'CL2' and 'COM' terminal with the jumper wires. See Fig.21.

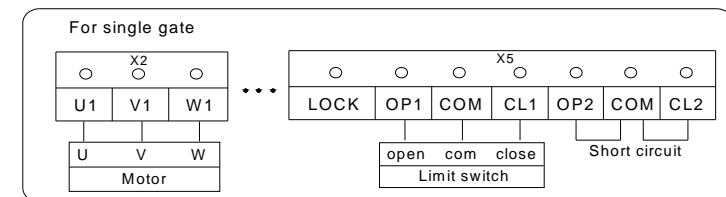


Fig.21

Infrared photocell (Normally open)

If the infrared beam is interrupted during closing, the gates will reverse and open immediately. During opening, the beeper will ring.

Connect signal wire of infrared device to 'IR' (see Fig.22 terminal X6), connect common wire (i.e. 'power supply -') of infrared device to 'COM', and connect 'power supply +' of infrared device to '12V'.

The control box is not factory equipped with an infrared device. The infrared device can be obtained through your dealer.

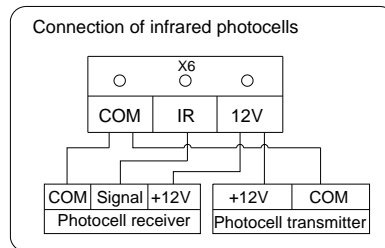


Fig.22

Install the external button switch (Normally open)

The ZK1800 is equipped with an interface for an external button switch or keypad.

To install the keypad attach two wires of your keypad to the 'O/S/C' terminal. The keypad will function in single channel mode.

For three-button switch installation, use the terminals for multi-channel mode. The port 'COM' is the common port, the port 'K' is used to open the gate, 'G' is used to close the gate, and 'T' is used to stop the gate. (See Fig.23 terminal X7)

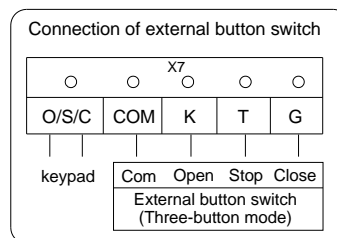


Fig.23

**11. Electrical / Setting**Learn / erase remote controls

Adding extra remote controls (Learn):

- Press the 'LEARN' button on the control board (see Fig.18 No.7), then the green indicator 'LED2' (see Fig. 18 No.6) will be on.
- Press the remote control button which you want to use, the 'LED2' will turn off.
- Press the same button again, the 'LED2' will flash about 5 seconds at 2Hz frequency. The learning process is finished.
- Up to 25 remote controls may be used.

To erase all remote controls

- Press and hold the 'LEARN' button on the control board until 'LED2' turns on and then turns off. This indicates that all the remote controls have been erased completely.
- The remote control works in a single channel mode. With each press of the remote control button which has been programmed, the gate will close, stop, open or stop cycle.

**Warning: Notify the users that the gate is never to be operated unless it is in full view.**

**For safety and security, we recommend that the factory setting be replaced with a personal code.**

Auto-reverse function

- Slowly rotating the reverse sensitivity sensor 'FORCE ADJ' (see Fig.18 No.1 and No.2) with a screwdriver, 1# sensor can be used to adjust primary operator, 2# sensor can be used to adjust secondary operator.
- Rotating the sensor clockwise increases the force. Rotating the sensor anticlockwise decrease the force.
- Place an immobile object along the gate path, allowing the gate to strike it while in the open or close cycle. The gate will reverse if obstructed when closing and will stop if jammed when opening.
- If it does not, increase or decrease the force and repeat this test. Repeat the steps until the correct force has been set.
- Operators must be individually adjusted, repeat the steps as above for the secondary operator using the 2# sensor.

Auto-close function

- Place the jumper cap on both pins of terminal 'SW' see Fig.18, No.9, the gates will stay open for  $30 \pm 3$  seconds before automatically closing.
- Remove the jumper cap or place the jumper cap on one pin of terminal 'SW', the auto-close function is shut off.

An Infrared device is required to be installed for safety if the auto-close feature is enabled.

Factory preset: the auto-close function is shut off.

Open priority

The gate will return to open if you press the 'OPEN' button on the three-button mode external button switch during closing, the beeper will ring.

Operation

- Unlock the gate operator with the key. Push the gates to the opened position manually. Lock the gate operator with the key.
- Turn the power on.
- Close the gates by using remote control or external button switch. The primary and the secondary gates close at the same time.
- After 14 seconds, the primary gate-leaf does not move until the secondary gate-leaf stops at its closed position automatically, the secondary gate section will stop earlier than the primary gate section with lock, so that both sections can be locked properly, or you can stop the gate at its closed position by remote control or external button switch.
- If gates do not stop or bind before stopping, verify that the stop is firmly in place, and the sensitivity adjustment knob for that gate on the control board is adjusted correctly. Adjust counter-clockwise to reduce binding.
- Open the gates by remote control or external button switch. Firstly, the electrical lock will be opened, the primary gate-leaf with lock opens, after 2 seconds, the primary gate-leaf does not move until the secondary gate-leaf opens, then the two gates open simultaneously and stop at its opened position automatically, or you can stop the gates at its opened position by remote control or external button switch.
- If gates do not stop or bind before stopping, verify that the stop is firmly in place, and the force adjustment knob for that gate on the control board is adjusted correctly. Adjust counter-clockwise to reduce binding.

**12. Maintenance**

- Add 1# lithium base grease to lead screw regularly.
- Regularly verify that the gate swings freely and add grease regularly.
- Make sure the hinges function perfectly.
- Verify correct operation of the safety devices.
- Keep operator clean at all times.

**13. Troubleshooting**

Table 5

Symptoms	Possible cause	Remedy
Motor fails to work.	Power is OFF or wiring is incorrect.	Turn the power ON. Check the wiring.
Motor runs, but gate does not open or close.	(1) The gate is obstructed. (2) The lead screw is obstructed. (3) The operator is released.	(1) Remove obstructions. (2) Clean the lead screw, add grease if necessary. (3) Engage the operator.
Gate fails to reverse.	The 'FORCE ADJ' is adjusted too high.	Adjust 'FORCE ADJ' anticlockwise to decrease force.
Gate begins to close, then reverses.	(1) The 'FORCE ADJ' is adjusted too low. (2) The gate is obstructed.	(1) Adjust 'FORCE ADJ' clockwise to increase force. (2) Remove obstructions.
Gate running direction is not correct, or gates run in different direction.	Wiring is incorrect.	Change the wires 'V1' and 'W1' or 'V2' and 'W2'. If the wiring between two gates is wrong and the gates cannot work, please check the wiring between 'U1, V1, W1' and 'U2, V2, W2'.
Remote control does not work.	(1) The indicator light of remote control does not light. (2) Remote control is not suitable for receiver.	(1) Battery level may be low, replace the battery inside the remote control. (2) Re-program the remote control.
Gate does not open far enough or does not have the proper opening angle.	The gate operator is not installed properly according to Fig.1-2 in the gate geometry section of this manual.	Either modify the installation to meet Fig.1-2 or adjust the size or replace the installation brackets in accordance with the gate geometry section of this manual.