

L110A SLIDING GATE OPERATOR

USER'S MANUAL

**ROLLING STEEL INC.
BROOKLYN, NY**

OUTLINE

1. Important safety information	3
2. Main features	3
3. Technical parameters	3
4. Packing list	4
5. Installation	4
6. Electrical	7
7. Control	11
8. Adjustment	15
9. Maintenance	15
10. Troubleshooting	16

1. Important safety information

Carefully read and follow all safety precaution and warnings before attempting to install and use this operator, incorrect installation can lead to severe injury.

- The gate operator should be installed by a qualified technician; otherwise, serious personal injury or property damage may occur.
- The automatic gate operator must be grounded.
- 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.
- When opening or closing the gate, do not attempt to walk or drive through the gate.
- Children should not be allowed to play near or operate automatic gates.
- Install the gate operator on the inside of the property, DO NOT install it on the outside of the property where the public has access to it.
- 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.
- In the event of power failure, an emergency release key allows you to operate the gate manually.
- The operator should be switched off before repairing it or opening its cover.
- Please erase and reset the code after installing the operator.

2. Main features

- The device is used to drive the sliding gate.
- For your safety, the operator will stop and reverse if it was obstructed on closing and stop when it was obstructed on opening.
- Supports up to 100 remote controls.
- Infrared terminal (N.C.) is supplied to use.
- Memory card can be unplugged.
- Auto-close feature is available for this operator.
- Pedestrian mode.
- Manual key release design for emergency purposes.

3. Technical parameters

Table 1

Type	L110A
Power supply	AC110V, 60Hz
Output torque	15N • m
Motor speed	1650rpm
Reduction ratio	1:30
Limit switch	Spring limit switch
Remote control operating range	30 m
Frequency	433.92 MHz
Remote control mode	Single-button
Auto-close time	0-44 sec.
Noise	≤58 dB
Environmental temperature	-10°C to +55°C

4. 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

No.	Item	Quantity
1	Gate operator	1
2	Release key	2
3	Operator base	1
4	Tighten bar	2
5	Screw for mounting angle iron bracket	4
6	Anchor bolt with nut	4
7	Angle iron bracket	2
8	Limit block	2
9	Anchor	4

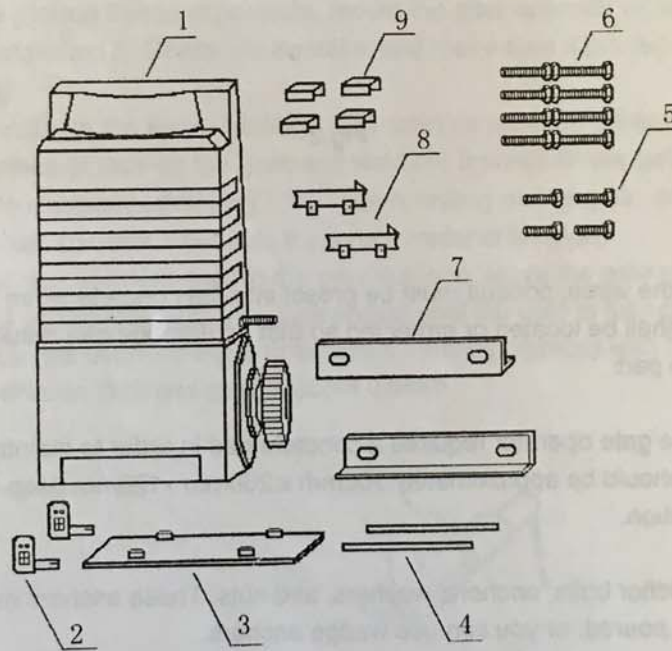


Fig.1

5. Installation

The L110A rack-driven gate operator operates by forcing a drive rack past a drive gear. The entire configuration is shown in the diagram below.

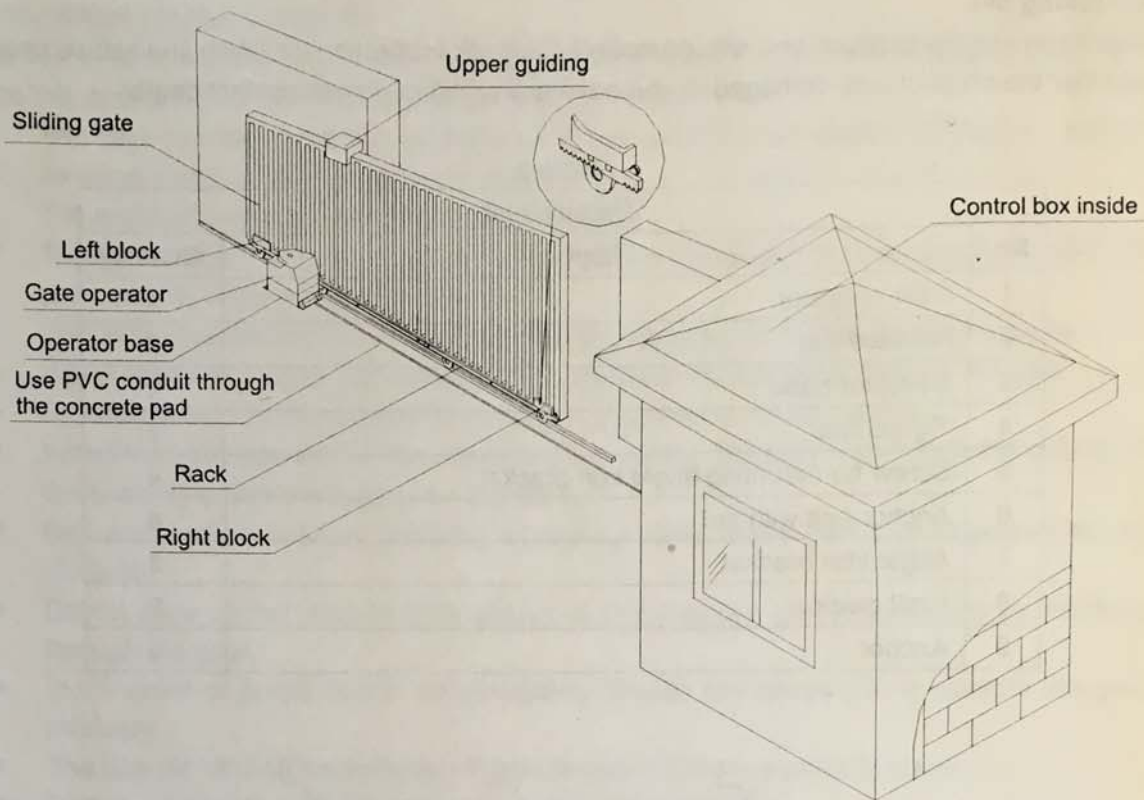


Fig.2

Conduit

In order to protect the wires, conduit must be preset into the concrete when it is poured. Wires within the conduit shall be located or protected so that no damage can result from contact with any rough or sharp part.

Concrete pad

The base unit of the gate operator requires a concrete pad in order to maintain proper stability. The concrete pad should be approximately 300mm x 260mm x 120mm deep in order to provide for adequate operation.

Anchors

You can use the anchor bolts, anchors, washers, and nuts. These anchors must be set into the concrete when it is poured, or you can use wedge anchors.

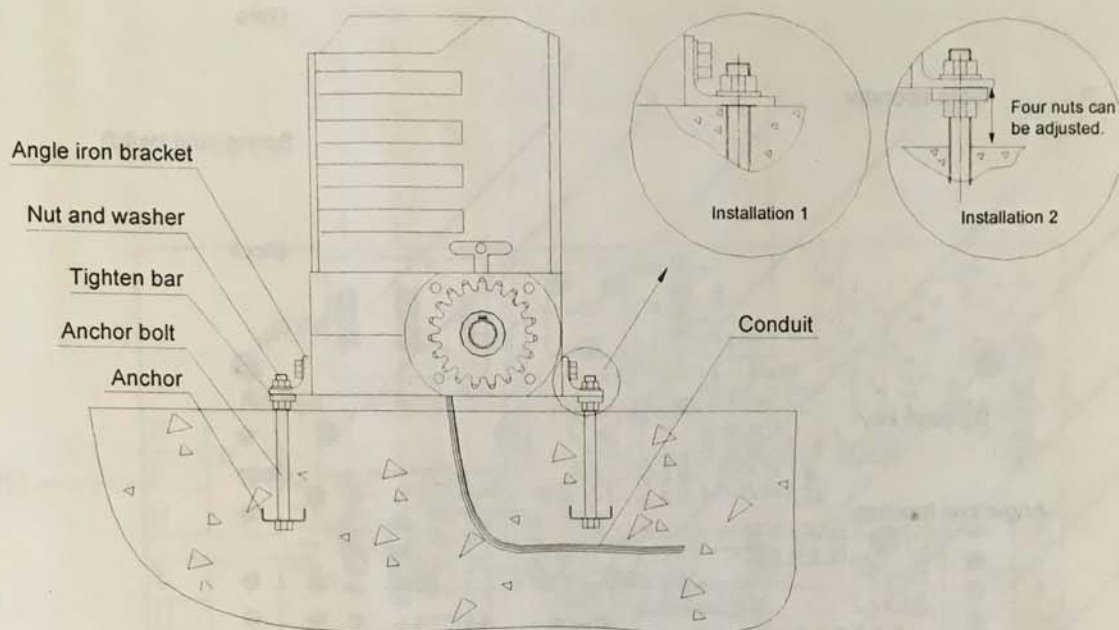


Fig.3

Operator

In locations where ground freeze is possible, mount the gate operator as shown in Fig.3 installation 1 or installation 2. Check the operator and make sure it is lined up with the gate.

Installation of rack

- Fix the three nuts (in the same package with rack) on the rack element.
- Lay the first piece of rack on the gear and weld the first nut on the gate.
- Move the gate manually, checking if the rack is resting on the gear, and weld the second and the third nut. (or fasten the nuts if the rack material is nylon)
- Bring another rack element near to the previous one. Move the gate manually and weld the three nuts as the first rack, thus proceeding until the gate is fully covered.
- When the rack has been installed, to ensure it meshes correctly with the gear.
- The space between rack and gear is about 0.5mm.

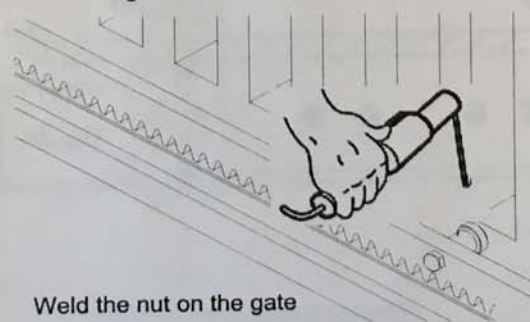


Fig.4

Limit switch (see Fig.5 and Fig.6)

- To ensure safety, it is recommended to install limit devices at both ends of the gate to prevent the gate from sliding out of the rails. The rails must be installed horizontally.
- Install the block as shown in Fig.5 and Fig.6. The spring limit switch and blocks are used to control the position of the gate.
- Release the gear clutch with the key and push the sliding gate manually to pre-determine the position, fix the block to the rack and then tighten the gear clutch with the key. Moving the gate electrically, adjust the block to the proper position until the position of the opening and closing meet the requirement.

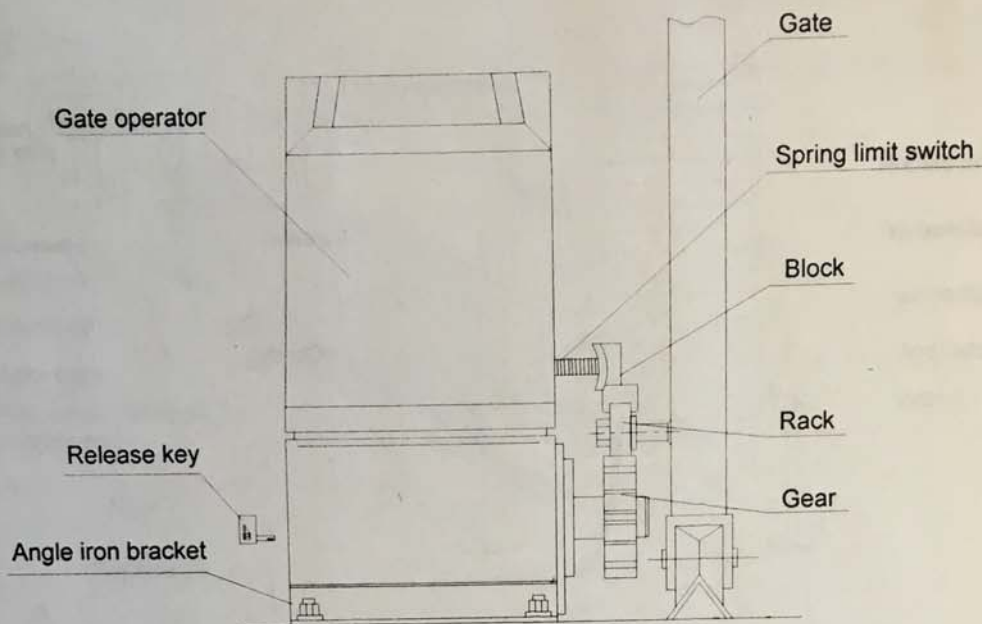


Fig.5

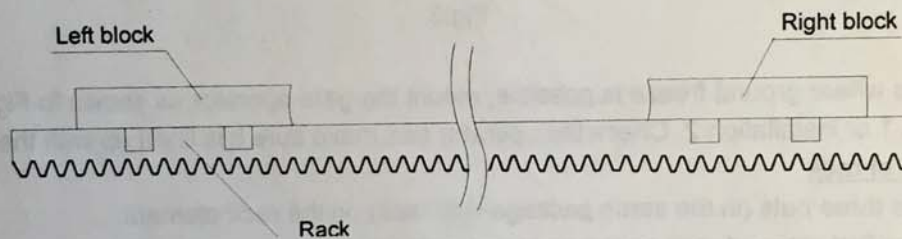


Fig.6

6. Electrical

Make sure that the power is OFF before making any electrical connections. Remove the cover of the control box, perform the wiring and replace the cover again. (Refer to control board scheme and wiring notes)

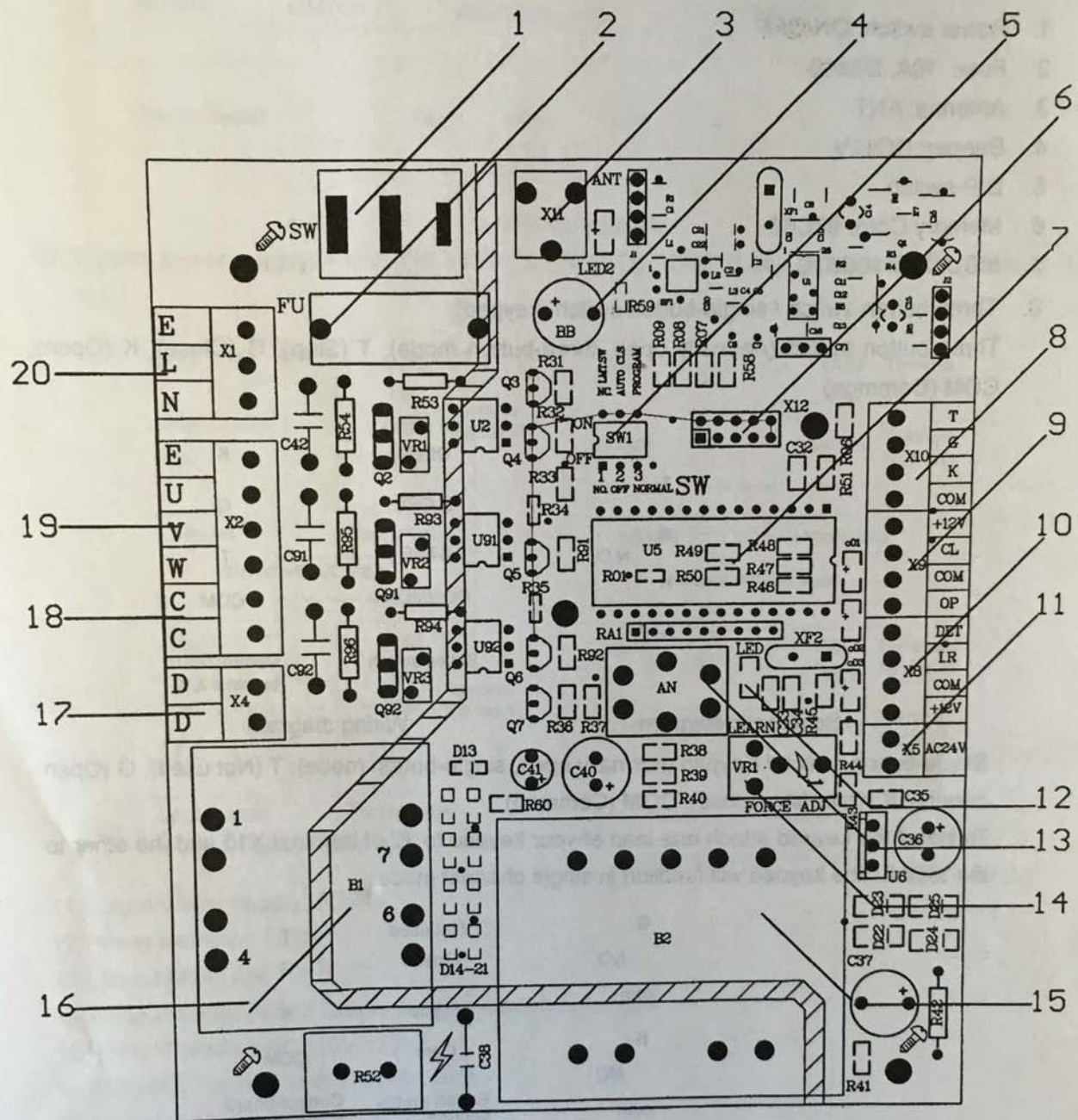
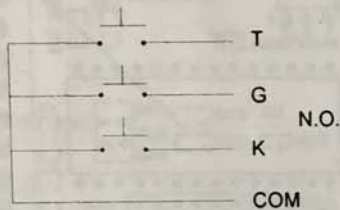


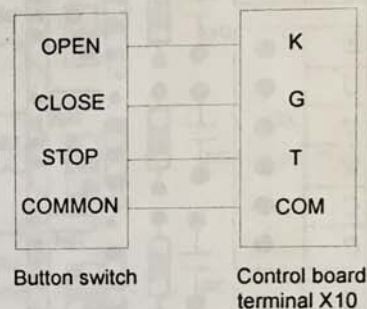
Fig.7 Control board scheme

Wiring notes for control board

1. Power switch: ON/OFF
2. Fuse: 10A, Ø5x20
3. Antenna: ANT
4. Beeper: DC12V
5. DIP-switch
6. Memory Card: 93C66
7. MCU: PIC 16C57C
8. Three button switch / single-button switch (keypad):
Three-button switch (normally open, three-button mode): T (Stop), G (Close), K (Open), COM (Common)



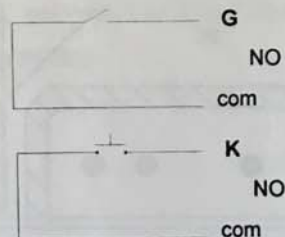
Schematic diagram



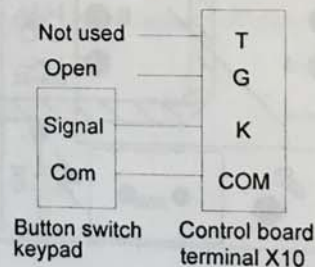
Wiring diagram

Single-button switch / Keypad (normally open, single-button mode): T (Not used), G (Open priority), K (Open/stop/close), COM (Common)

To install the keypad attach one lead of your keypad to 'K' of terminal X10 and the other to the 'COM'. The keypad will function in single channel mode.



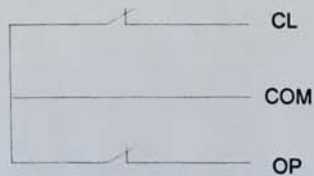
Schematic diagram



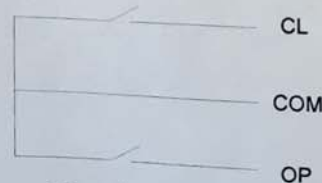
Wiring diagram

NOTE: Two modes (three-button mode or single-button mode) you can select according to your order.

9. Limit switch: CL (Close limit), COM (Com), OP (Open limit), +12V (Output power supply)



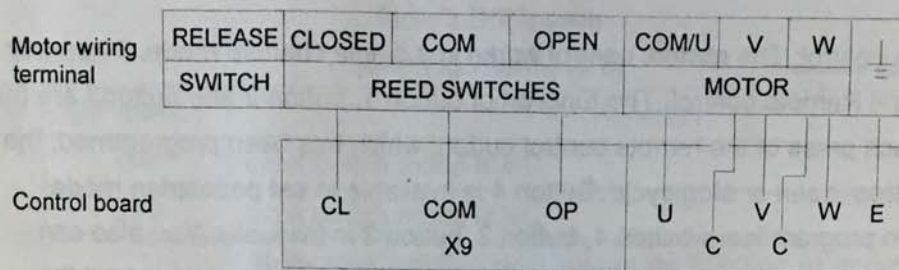
N.C. (For N.C. limit switch)



N.O. (For N.O. limit switch)

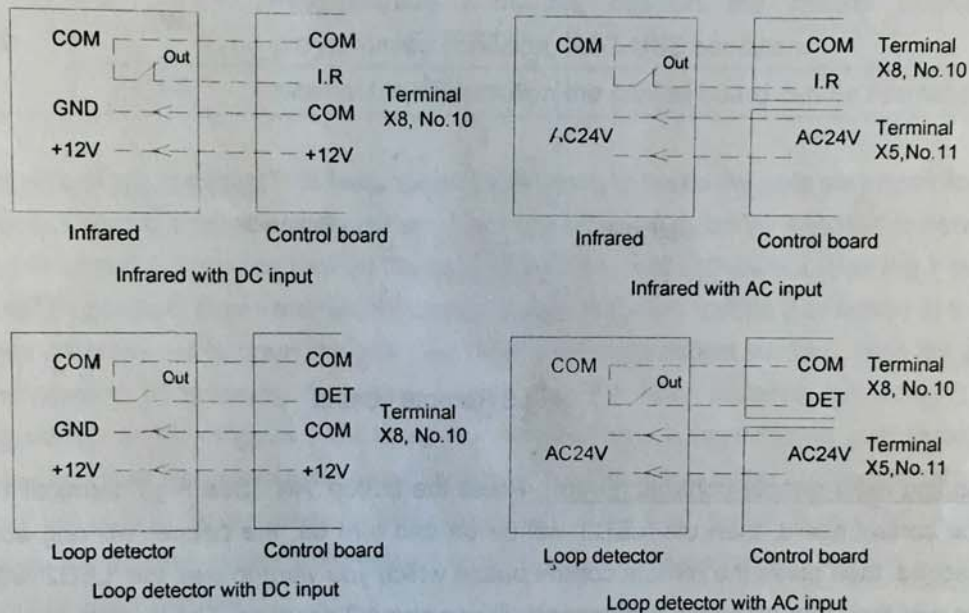
Limit switch mode is adjustable by DIP-switch. (See table 1)

Schematic diagram



Wiring diagram

10. Output power supply: +12V (DC +12V), COM (CO), DET (Loop detector), I.R. (Infrared N.C)



11. Output power supply: AC24V

12. Power Indicator: LED

13. Learn button: AN

14. Force Adjustor (VR1): Clockwise +, Counterclockwise -

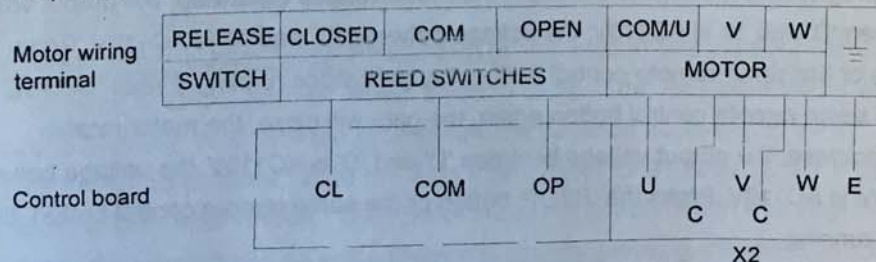
15. Power Transformer: 110V/12Vx2

16. Sampling Transformer: 110V/8.8V 4W

17. Alarm Lamp: AC110V

18. Motor Capacitor

19. Motor: U (com), V (Positive direction), W (Opposite direction), E (Earth)



Wiring scheme

20. Power Input: E (Earth), L (Live), N (Neutral) AC110V

7. Control

- Remote control:** The remote control works in a single channel mode. It has four buttons. See Fig.8 Remote control. The function of button 1, button 2 and button 3 are the same. With each press of the remote control button, which has been programmed, the gate will close, stop, open or stop cycle. Button 4 is available to set pedestrian mode. You can program/learn button 1, button 2, button 3 individually. You also can program/learn two buttons or three buttons together, but you need repeat the program/learn process if you want to use more than one button.

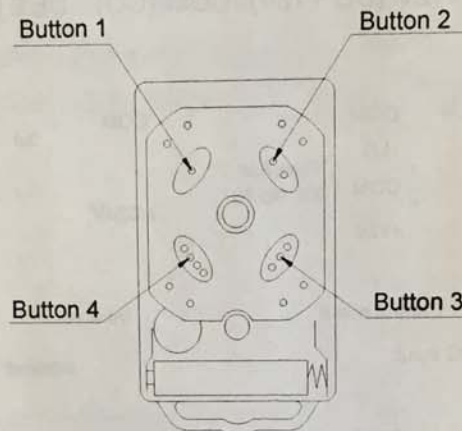


Fig.8 Remote control

- Adding extra remote controls (Learn):** Press the button 'AN' (See Fig.7 terminal 13) on the control board, then the 'LED2' will be on and turn off, the beeper will ring about 1 second, then press the remote control button which you want to use, the 'LED2' will turn on and then turn off again, the beeper will ring about 2 seconds. The learning process is finished.
Up to 100 remote controls may be used.
- Erase remote controls:** To erase all existing remote controls, press and hold 'AN' button, the beeper will ring, release the button once the beeper stops ringing. This indicates that all the remote controls have been erased completely.
NOTE: For safety and security, we recommend that the factory setting be replaced with a personal code.
- Press the 'OPEN' button of external button switch or remote control button which has been programmed, the gate will open, the motor rotates clockwise, the output voltage between 'D' and 'D' is AC110V, the voltage between 'U' and 'V' is AC110V. Press 'STOP' button or the same remote control button, the gate stops running. Press 'CLOSE' button or the same remote control button again, the gate will close, the motor rotates anticlockwise, the output voltage between 'D' and 'D' is AC110V, the voltage between 'U' and 'W' is AC110V. Press the 'STOP' button or the same remote control button, the gate stops running.
- Verify open direction:** If the gate does not move in the desired direction, then you will need to reverse the motor operating direction, you can do this by exchanging wires 'V' and 'W', 'OP' and 'CL'.

Table 3 DIP-switch
(See Fig.7 terminal 5)

Position	DIP-switch	Function
1	ON	Limit switch mode is NC.
	OFF	Limit switch mode is NO.
2	ON	Auto-close function and auto-close function of pedestrian mode are available.
	OFF	Both Auto-close function and auto-close function of pedestrian mode are shut off.
3	ON	Programming / In this position the control board is in programming condition, NOT USE condition.
	OFF	Normal / In this position the control board can be normally used.

- Set auto-close function (This feature can be selected to make the gate stay open for some seconds before it automatically closes. The auto-close time can be adjusted to between 0 and 44 seconds.): please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press the remote control button (button 1, button 2 or button 3) that has been programmed to open the gate (see **Verify open direction** section). Stop the gate at any position by pressing the same button, wait for some seconds according to your requirements (the range is 1~44 sec.), this period of time is regarded as 'auto-close time'. Close the gate by pressing the same button. Press the button again to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the auto-close function has been set.
- Cancel auto-close function: please turn on the second and the third DIP-switch (see Fig.7 terminal 5) to ON position. Press the remote control button (button 1, button 2 or button 3) that has been programmed to open the gate (see **Verify open direction** section). Stop the gate at any position by pressing the same button, wait until the gate close automatically (45 sec.). Press the same button to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the auto-close function has been cancelled.
- Pedestrian mode: Pedestrian mode can be used to open gate about 0.3~1.5 meters for people pass through.
 - * Set width of pedestrian mode: Please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press button 4 to open the gate (see **Verify open direction** section), Wait until the gate travels the distance according to your requirements (the distance range is 0.3m~1.5m or wait for 3~10 sec.), it is regarded as 'the width of pedestrian mode'. Then press the same button/button 4 to stop the gate, wait for some seconds (1~ 44 sec.). Close the gate by pressing the same button/button 4. Press the same button again to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the **width of pedestrian mode** has been set. If you open the gate with button 4, the gate will stop at the expected position that you

have set.

* Set auto-close function of pedestrian mode: Please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press button 4 to open the gate (see **Verify open direction** section), wait some seconds (3~10 sec.). Then press the same button/button 4 to stop the gate, wait some seconds according to your requirements (1~44 sec.), this period of time is regarded as 'auto-close time of pedestrian mode'. Close the gate by pressing the same button/button 4. Press the same button again to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the **auto-close function of pedestrian mode** has been set.

Note: the new width of pedestrian mode has been re-programmed in the device and replaced the original width you have set in **Set width of pedestrian mode** section.

If you open the gate with button 4, the gate will stop at the new expected position that you have set, after some seconds as what you have set, the gate will close automatically.

- Cancel width / auto-close function of pedestrian mode

* Cancel both width and auto-close function of pedestrian mode: Please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press button 4 to open the gate (see **Verify open direction** section). Wait for more than 15 sec.. Then press the same button/button 4 to stop the gate. Wait until the gate close automatically (45 sec.), press the same button/button 4 to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the width and auto-close function of pedestrian mode have been cancelled.

* Cancel width of pedestrian mode, keep auto-close function of pedestrian mode: Please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press button 4 to open the gate (see **Verify open direction** section). Wait for more than 15 sec.. Then press the same button/button 4 to stop the gate. Wait some seconds according to your requirements (1~44 sec.). Then press the same button/button 4 to close the gate, press the same button again to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the width of pedestrian mode has been cancelled, the auto-close function of pedestrian mode has been reserved.

Note: the new auto-close time of pedestrian mode has been re-programmed in the device and replaced the original auto-close time of pedestrian mode that you have been set in **Set auto-close function of pedestrian mode** section.

* Keep width of pedestrian mode, cancel auto-close function of pedestrian mode: Please turn on the second and the third DIP-switch (See Fig.7 terminal 5) to ON position. Press button 4 to open the gate (see **Verify open direction** section). Wait some seconds (3~10 sec.), then press the same button/button 4 to stop the gate. Wait until the gate close automatically (45 sec.). Press the same button again to stop the gate or the gate will stop at its closed position automatically if the limit switch is reached. After this setup is complete, return DIP-switch 3 to OFF position immediately. Thus the width of pedestrian mode has been reserved, the auto-close function of pedestrian mode has been cancelled.

Note: the new width of pedestrian mode has been re-programmed in the device and replaced the original width.

If you open the gate with button 4, the gate will stop at the expected position that you have set, but the gate will not close automatically.

- Turn on the second DIP-switch to OFF position (Factory preset: OFF position), both auto close function and auto-close function of pedestrian mode were shut off.

Note:

- (1) You must follow the operating instruction as above, any wrong operation is not allowed during setting. If your device responds to your requested function correctly, you have set the function successfully, otherwise repeat the above setup instruction until your device responds to your expected function.
- (2) If you change any one setting, other settings will be changed.
- (3) If the gate can not be moved, please check whether the gate is obstructed or gate is too weight.

Adjustment of the auto-reverse function: rotate the Force Adj. 'VR1' knob (see Fig.7 terminal 14) with a screwdriver, the resistance may be increased or decreased by rotating clockwise or counterclockwise. Note: if the gate fails to reverse in the event of obstruction, then the opening force or closing force should be checked for conformity with requirements and adjusted accordingly. The gate will reverse if obstructed when closing, and will stop if jammed when opening.

If the auto-reverse direction is wrong, please exchange two wires 'V' and 'W'. Exchange wires 'OP' and 'CL' if the limit direction is wrong.

Activities Covered in this section

- **Remote control (Single-button mode):** With each press of the button, the gate will close, stop, open or stop cycle.
- **External button switch (not supply): two different modes (three-button or single-button) you can select according to your order.**
Three-button external button switch: press 'OPEN' button, the gate will open. Press 'STOP' button, the gate will stop. Press 'CLOSE' button, the gate will close.
Single-button switch will function in single channel mode.
- **Auto-reverse function:** After adjusting the opening force and closing force, the gate will reverse and go open if obstructed when closing, and will stop if jammed when opening.
- **Auto-close function:** This feature can be selected to make the gate stay open for some seconds before it automatically closes. The auto-close time can be adjusted to between 0 and 44 seconds.
- **Pedestrian mode:** This feature can be used to open gate about 0.3~1.5 meters for people pass through.
- **Safe guard (Infrared photocell):** If infrared beam is interrupted during closing, the gate will reverse and go open immediately. This feature will not function if the gate is in fully opened and closed positions or during opening.
- **Open priority:** The gate will return to open if press 'OPEN' button of external button switch during closing.
- **Loop detector:** If loop detector detects vehicles during closing, the gate will reopen

immediately and stay open until the vehicles move out of the loop. After vehicles move out of the loop, the gate will continue to close.

If loop detector detects vehicles when the gate stops, the gate will remain stop until vehicles move out of the loop. After vehicles move out of the loop, the gate will close.

The gate will keep opening if loop detector detects vehicles during opening. After vehicles pass through the loop, the bar will close.

- **Limit switch:** The switch is used to accurately stop the gate in the opened and closed positions.

If the gate stops at opened position when the limit switch is reached, the gate will not move if you press 'OPEN' button.

If the gate stops at closed position when the limit switch is reached, the gate will not move if you press 'CLOSE' button.

- Adjust the pressure screw to make the output torque of the operator meet your requirement, that is, the device should be powerful enough to move the gate and capable of making friction plate skidding when it is blocked.
- The motor is only designed to work for less than 5 minutes. If it runs continually for an extended period of time, a thermal protector will stop it because of the high temperature.

8. Adjustment

Check the power supply, grounding and wiring before running the device.

Release the clutch with the key to determine whether or not the gate can be moved manually.

If everything is in good working order, engage the clutch with the key.

When engage the clutch with the key, be sure to close completely to prevent from damage.

Switch on the power and run the operator to ensure that the gate is sliding smoothly.

Tighten (or release) the force adjust bolt on the motor top to increase (or decrease) the output torque (i.e. output force of the operator), and ensure the gate safely.

Adjust the output torque in the safety range before using the operator.

9. Maintenance

Please check and add transformer oil (DB25-GB2536) regularly, you may change the oil according to the weather. If the temperature is lower than -20°C , you can select #45 oil.

Table 4 Parameters of DB25 transformer oil

Kinematic viscosity (20°C)	Break down voltage	Solidification point
≤ 30 Centistoke	≥ 35 kV	$\leq -25^{\circ}\text{C}$

Ensure the operator is well earthed, and correctly terminated.

Regularly grease the wheels and axles to ensure the gate moves smoothly.

Ensure the power is switched off before removing the cover.

Keep opener clean at all times.

10. Troubleshooting

Trouble	Possible causes	Solutions
Motor only runs in one direction.	The wire connector terminal block becomes loose.	Check wire connector terminal block make sure it is plugged in terminal block 10, X8.
	The limit switch wire connector terminal block becomes loose.	Check limit switch wire connector terminal block make sure it is plugged in terminal block 9, X9. Check the limit switch mode.
	The electric component on the control board such as Q2, Q91 or Q92 may be damaged.	Replace the electric component Q2, Q91 or Q92 (BTA16/600) or replace the board.
By pressing button 1(button 2 or button 3) which has been programmed to open the gate, press the same button again to stop the gate in required position, but the gate will auto-close immediately.	The auto-close time is too short.	Reset the auto-close time. See Set auto-close function section.
When you use button 4 of remote control to open the gate, gate travels too short.	The width of pedestrian mode is too narrow.	Reset the width of pedestrian mode. See Set width of pedestrian mode section.
When you use button 4 of remote control to open the gate, but the gate will auto-close immediately.	The auto-close time of pedestrian mode is too short.	Reset the auto-close time of pedestrian. See Set auto-close function of pedestrian mode section.
The gate will not open or close.	The limit switch wire connector terminal block becomes loose.	Check the limit switch mode (see table 3 DIP-switch).
	Connecting wires or terminal blocks are too loose.	Check the connecting wires and terminal blocks.
	The electric component on the control board such as Q2, Q91 or Q92 may be damaged.	Replace the electric component Q2, Q91 or Q92 (BTA16/600) or replace the board.
	Power switch is OFF.	Make sure power switch is ON.
Remote control does not work	The indicator light of remote control does not light.	Check the batteries on your remote control
	Remote control is not suitable for receiver.	After making sure the codes are correct, erase remote controls and then re-program the codes in the device. See Adding extra remote controls (learning) section.
	Broken receive board	Replace receive board.
When you open the gate by using button 1(button 2 or button 3) which has been programmed, gate will stop in mid-travel or reverse before reaching the fully limit position.	The Force Adj. (VR1) is adjusted too small.	Check the Force Adj. (VR1). Adjust VR1 to increase force.
	Gate is obstructed.	Remove the obstruction.
The remote control operating distance is too short.	Signals are shielded by the gate.	Link a new antenna (1~1.2m BVR 0.75mm ²) to the old antenna. Then fix the antenna on the wall vertically, make sure the total height from the top of antenna to the ground is approx. 1.5m.