Sliding Gate Operator

User's Manual

Model: DKC600(U) & DKC600 (U)Y

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.

CONTENT

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.
- 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.
- The automatic gate operator must be grounded.
- 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 reprogram the code after installing the operator.
- Additional safety equipment such as photoelectric sensors, alarm lamp must be installed to prevent injury.
- Any changing of the opening & closing speed is not allowed. If you have any special requirements, please kindly contact a dealer.
- Our company reserves the right to change the design and specification without prior notification.

2. Main Technical Parameters

Tab.1

Model	DKC600	DKC600U	DKC600Y	DKC600UY
Power supply	AC 220V, 50Hz	AC110V, 60Hz	AC 220V, 50Hz	AC110V, 60Hz
Motor speed	1400 rpm	1680 rpm	1400 rpm	1680 rpm
Gate moving speed	14m/min (24 teeth) 12m/min (19 teeth)	17 m/min (24 teeth) 13m/min (19 teeth)	14m/min (24 teeth) 11m/min (19 teeth)	17 m/min (24 teeth) 13m/min (19 teeth)
Control unit	Control box (optional)		All-in-one gate operator, control board included	
Max.gate weight	600 Kg			
Output torque	14N・m			
Limit switch	Magnetic limit switch or spring limit switch（according to your order）			
Remote control operating range	30m			
Frequency	433.92 MHz			
Noise	≤60 dB			
Ambient temperature	-10°C~+50°C			

3. Main Features

- The device is used to drive sliding gate.
- For your safety, the gate operator will stop and reverse if it was obstructed on closing and stop when it was obstructed on opening.
- User programmable and user erasable remote codes.
- Infrared terminal (N.C) is supplied to use.
- Manual key release design for emergency purposes.

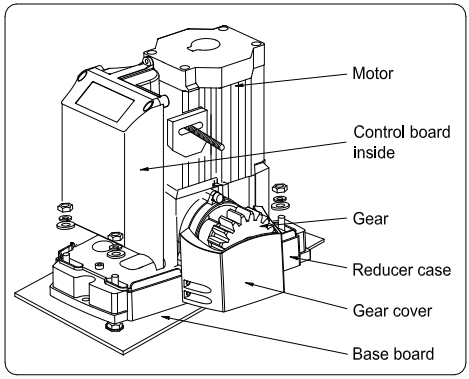


Fig.1

4. Working Principle and Main Structure

DKC600(U)Y all-in-one multifunctional sliding gate operator integrated the electric control board into the operator, it is composed of a single-phase motor, worm and worm gear, the main shaft of the motor rotates the worm with the clutch engaged, the worm rotates the worm gear and output gear, which pushes the rack attached to the sliding gate, thus moving the gate. Control board not included in DKC600 (U) main unit, it can be fitted with the KZB14-2.

5. Installation and Adjustment

The DKC600(U) & DKC600(U)Y rack-driven gate operator operates by forcing a drive rack past a drive gear. The entire configuration is shown in Fig.2 or Fig.3. The gate operator must be installed on the inside of the gate.

Gate preparation

Be sure the gate is properly installed and slides smoothly before installing the sliding gate operator. The gate must be plumb, level, and move freely.

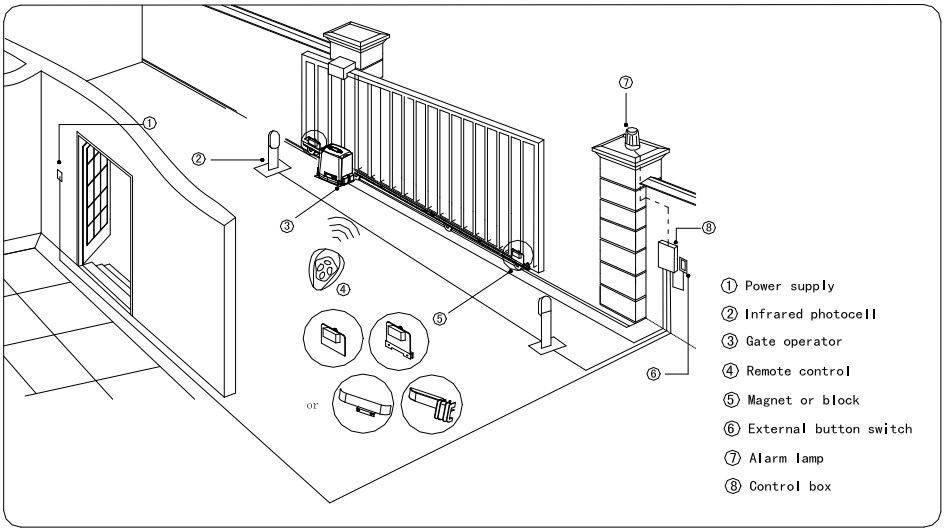


Fig.2 DKC600(U) gate operator

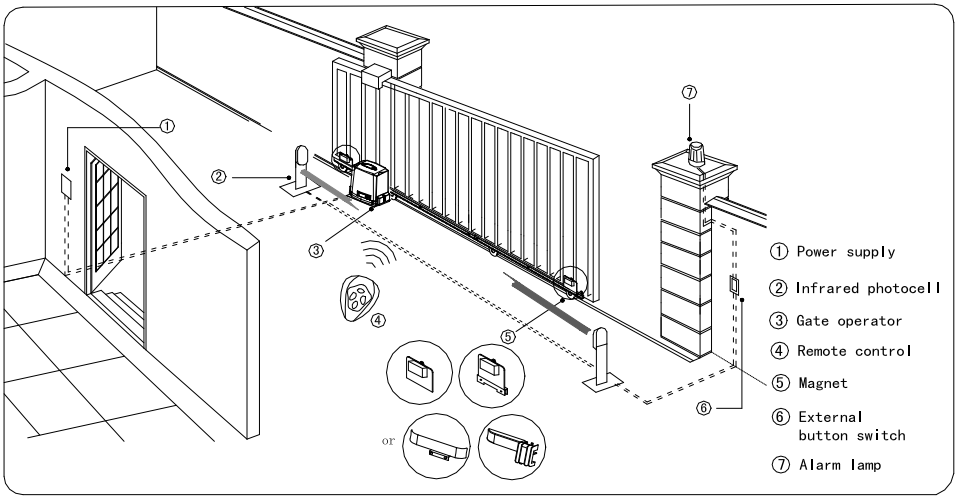


Fig.3 DKC600(U)Y Gate operator

Conduit

In order to protect the wires, use PVC conduit for wires, conduit must be set 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 200mm x 200mm deep in order to provide for adequate operation. The pad should be 70mm above finish grade. Be sure to locate the pad so that it will not interfere with the gate.

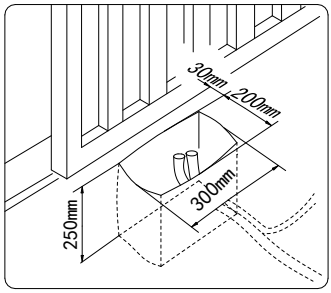


Fig.4

Anchors

You can use the anchors, bolts, washers and nuts that are provided with the operator see Fig.5. These anchors must be set into the concrete when it is poured, or you can use wedge expansion bolts.

Operator base

Mount the gate operator base to the concrete pad see Fig.5.Verify that the operator is leveled properly.

Operator

Mount the gate operator to the base using nuts and washers.

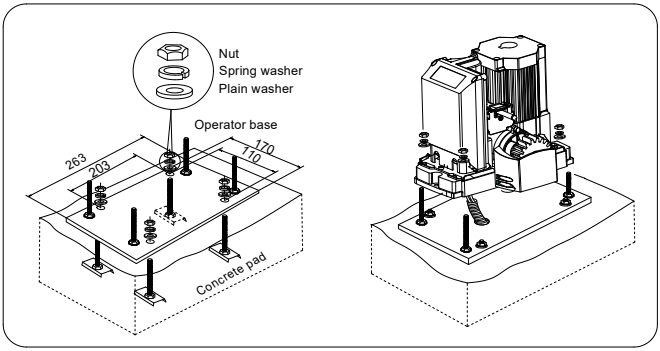


Fig.5

Installing the rack (see Fig.6)

Weld the steel rack

- Manually move the gate to its closing position.
- Place the three threaded pawls (in the same package with rack) on the rack element.
- Lay the first piece of rack on the gear and weld the first threaded pawl on the gate.
- Move the gate manually, checking if the rack is resting on the gear, and weld the second and third pawls.
- The space between rack and gear is about 1mm.
- Bring another rack element near to the previous one. Move the gate manually and weld the three pawls 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.
- If necessary, assemble the spacer between the rack and pawl to synchronise the teeth of the two rack elements and keep racks in a straight line. See Fig.6

Screw the nylon rack

- Manually move the gate to its closing position.
- Lay the first piece of rack on the gear and mark the drilling point on the gate, drill a hole and screw the bolt.
- Move the gate manually, checking if the rack is resting on the gear, and repeat the above operations.
- Bring another rack element near to the previous one. Move the gate manually and carry out the securing operations, thus proceeding until the gate is fully covered.

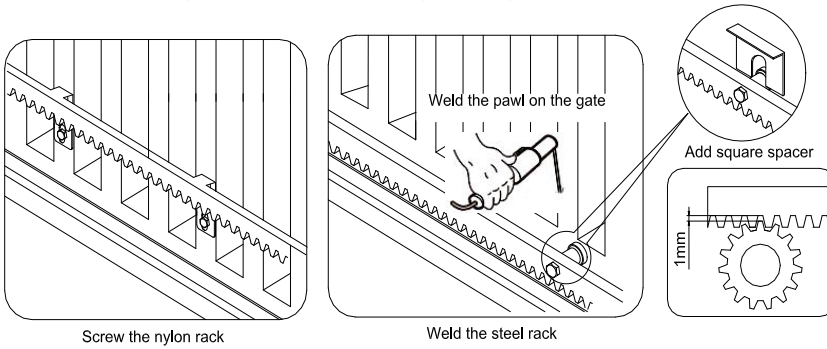


Fig.6

Magnets for limit switch

Install the magnet as shown in Fig.7 and Fig.8. The magnet and limit switch are used to control the position of the gate. When the magnet is installed, release the gear clutch and push the sliding gate manually to pre-determine the position. Weld or fit the magnet bracket to the rack and then tighten the gear clutch. The lower bracket is for open position and higher bracket is for close position. Finally adjust the magnet to the proper position by moving the gate with the motor. The magnet should be 10-15mm away from the magnetic limit switch. If it is too far

away, the switch will fail to work. Adjust the position of the magnets until the positions of the opening and closing meet the requirement.

Important Note: Please note the two magnet brackets (fixed plate) are different: one is higher and another is lower. Verify and if necessary exchange the two brackets position. Also if necessary exchange the limit switch wires CL (close) and OP (open). Another common problem is there are two reed switches inside the magnetic limit switch: one is upper and another is lower. The magnet position can be installed in the middle so it inducts both reed switches. Solution: adjust the magnet upper or lower.

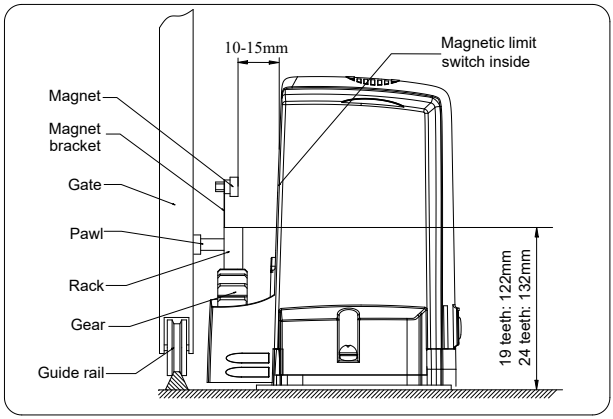


Fig.7

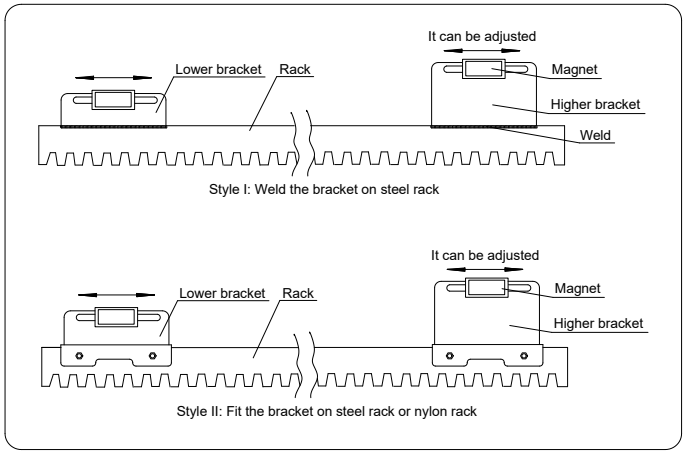


Fig.8

Spring limit switch

Install the block as shown in Fig.9 and Fig.10. Release the gear clutch with the key and push the sliding gate manually to pre-determine the position, screw 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.。

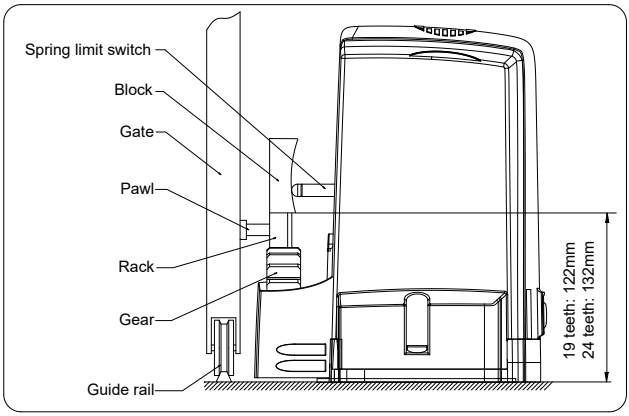
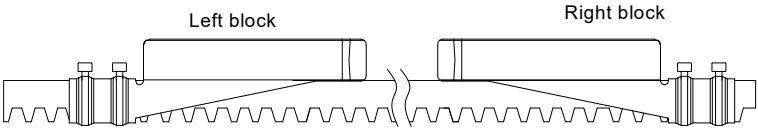


Fig.9



Screw the block on steel rack.

Style III

Fig.10

Tab. 2

Limit switch	Rack	Magnet bracket	Block
Magnetic limit switch	Steel	Style I (see Fig.8)	/
		Style II (see Fig.8)	/
	Nylon	Style II (see Fig.8)	/
Spring limit switch	Steel	/	Style III (see Fig.10)
Note: the rack and magnet bracket / block came with your gate operator depends on your order, select the proper installation method according to your needs.			

Manual operation (see Fig.11)

In case of power failure use manual release key to open or close gate manually, use the release key as follow:

- Remove the cover.
- Fit the supplied key in the hole.
- Turn the key **counterclockwise** to release the clutch.
- Pull the release lever.
- Open and close the gate manually.
- After power-restored close the release lever, then use the manual release key to engage the clutch by turning the key **clockwise** and resume normal operation.

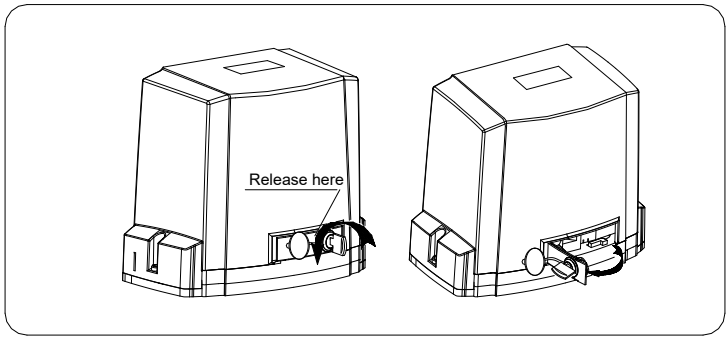


Fig.11

6. Connecting ----DKC600(U)

Make sure the control box power switch is OFF before connecting.

The DKC600(U) has a terminal block, Fig.12 shows the wiring of motor and limit switch, the DKC600(U) is not equipped with control box, the control box (XF24W or XF24U) can be purchased through your dealer.

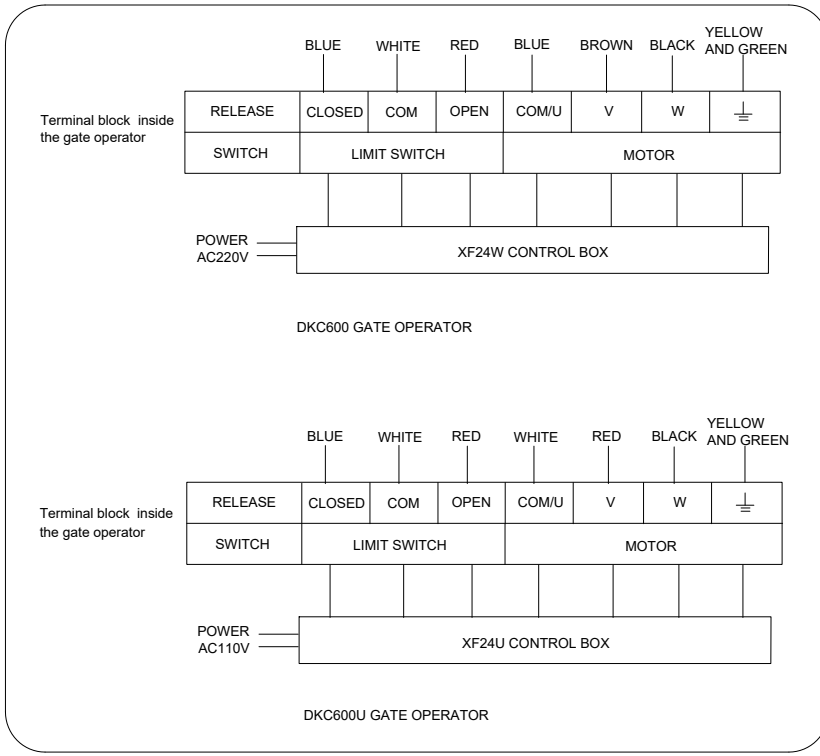
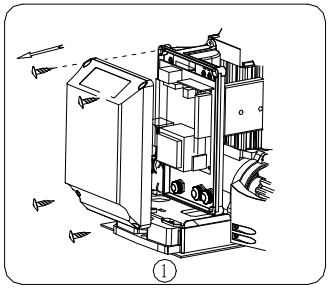


Fig.12

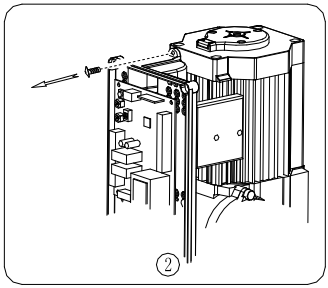
7. Connecting ----DKC600(U)Y

Make sure that the power is OFF before making any electrical connections.

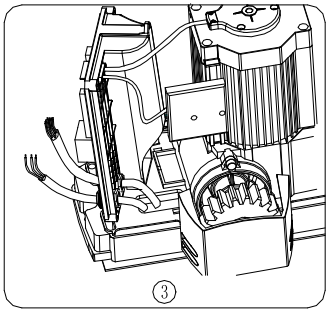
Control board included in the gate operator, Perform the wiring.



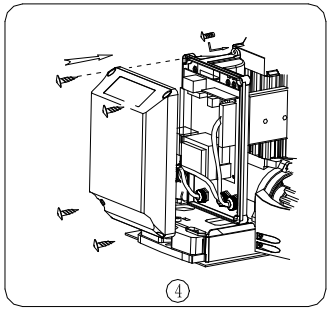
Open the cover.



Loose the screws on the control board.



Lead the cable through the control board, fasten the waterproof connectors.



After wiring, tighten the screws then close the cover.

Fig.13 Wiring

8.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 Fig.14 control board scheme and wiring notes)

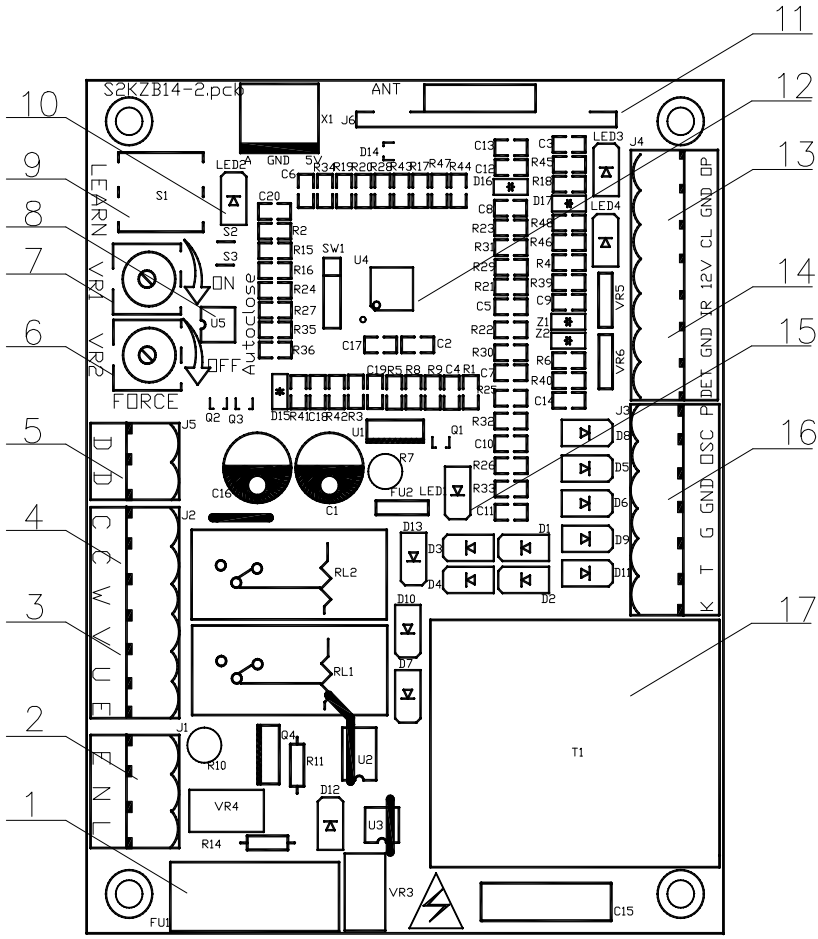
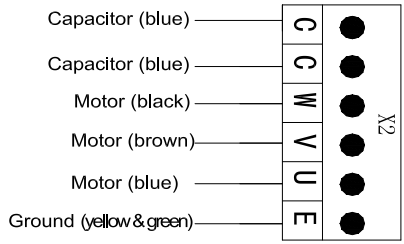


Fig.14 KZB14-2 Control board scheme

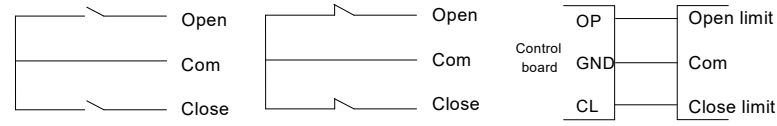
Wiring notes for control board

1. Fuse:5A, φ5x20(220V), 10A φ5x20(110V)
2. Power supply: E(Ground), N(Neutral), L(Live)
3. Motor: U (Com), V (Positive direction), W (Opposite direction), E (Earth)
4. Capacitor



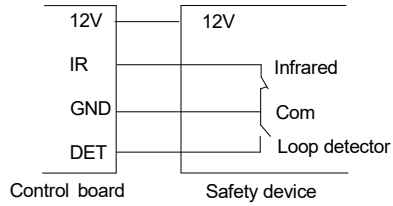
5. Alarm Lamp (not supply): AC220V, AC110V
6. Force Adjustor (VR2): Clockwise +, Counterclockwise –
7. Force Adjustor (VR1): Clockwise +, Counterclockwise –
8. DIP-switch
9. Learn button: LEARN
10. Indicator light (learn): LED2
11. Receiver
12. MCU: stm8s103
13. Limit switch(N.C.) : OP(open),GND(com), CL(close),

Snip short wire 'S2' , Limit switch : N.O.

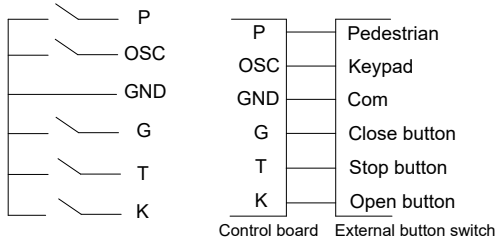


Limit switch mode is adjustable by DIP switch.

14. Output power supply: 12V(DC 12V), GND(COM), DET(Loop detector), IR(Infrared photocell)



15. Power indicator light: LED1
16. External button switch: P（Pedestrian mode）、OSC（Keypad）、GND（Com）、G (Close)、T（Stop）、K（Open）



Schematic diagram　　Wiring diagram

17. Transformer： 220V/10V 5W, 110V//10V 5W

9.Control

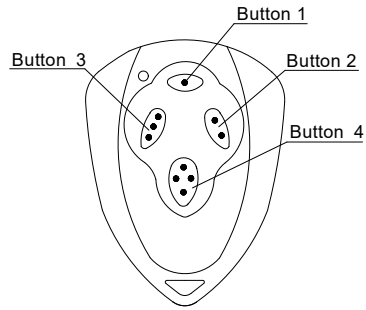


Fig.15

- Adding extra remote controls (learn): Press the button 'LEARN' about 1 second(See Fig.14 terminal 9) on the control board, release the button till the 'LED2' turns on, then press the same remote control button which you want to use twice, the 'LED2' will flash several times and then turn off, The learning process is finished.
  Up to 40 remote controls may be used.
- Erase remote controls: To erase all existing remote controls, press and hold 'LEARN' button about 8 seconds till the 'LED2' turns on and turns off. This indicates that all the remote controls have been erased completely.
- **Warning: For safety and security, we recommend that the factory setting be replaced with a personal code.**
- The remote control works in single channel mode. See Fig.15. with each press of the button, the gate will close stop open stop cycle.
- Warning: Notify the users that the gate is never to be operated unless it is in full view.
- 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'.
- Exchange wires 'OP' and 'CL' if the limit direction is wrong.

WARNING: Do not attempt to tune the gate by placing your hand, arm or other body part in the path of the gate, as serious injury could result. Damage to the gate operator motors may also occur by placing a heavy immovable object in the path during the testing phase. Instead, place a light object in the path (e.g., a chair or trash can) which can be pushed out of the way without causing damage to gate motors. Once the tuning is complete you may replace the cover.

- **External button switch (not included): two different modes you can select according to your order.**
- Three-button external button switch: connect external button switch to terminal 'K', 'T', 'G' and 'GND'. Press 'OPEN' button, the gate will open. Press 'STOP' button, the gate will stop. Press 'CLOSE' button, the gate will close.
- Single-button/keypad: connect keypad to terminal 'OSC' and 'GND', with each press of the button, the gate will close, stop, open or stop cycle.
- **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 by DIP-switch.

Auto-close time	1second	10 seconds	30 seconds	Auto close function is unavailable
Position 1	ON	OFF	ON	OFF
Position 2	OFF	ON	ON	OFF

WARNING: Infrared photocell must be used.

- **Pedestrian mode**: Connect the pedestrian button switch to 'P' and 'GND' terminal on the control board. Set auto close time first (auto-close time can be adjusted by DIP-switch), press the button 4 of remote control or pedestrian button switch, the gate will open about 1.2 meters for people pass through, after passing through the gate, the gate will close automatically.
- **Adjustment of opening & closing force:** rotate the 'VR1' (See Fig.14 terminal 7) knob with a screwdriver to adjust opening & closing force, the force may be increased (or decreased) by rotating clockwise (or counterclockwise). If you turn the variable resistor clockwise it will increase force. If you turn the variable resistor counterclockwise, it will decrease force.
- **Adjustment of soft stop width**: Rotate the 'VR2' knob (See Fig.14 terminal 6) to adjust soft stop width, the width may be increased by rotating clockwise (soft stop width: 0-40cm adjustable).
- **Infrared photocell (not included)**: If infrared beam is interrupted during closing, the gate will reverse and go open immediately. Connect infrared photocell to terminal 'IR' and 'GND' on the control board. Short 'IR' and 'GND' if infrared photocell is not used.
- **Open priority:** The gate will return to open if press 'OPEN' button of external button switch during closing.
- **Loop detector:** connect loop detector (N.O.) to terminal block 'DET' and 'GND' .
  If loop detector detects vehicles during closing, the gate will open 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 open immediately until vehicles move out of the loop. After vehicles move out of the loop, the gate will close.
- **Soft start:** snip the short wire 'S3', the gate will start softly.
- **Over- heat protection:** The device is equipped with a thermal protector. The motor is only designed to continuous work for less than 15 minutes. If it is runs continually for an extended period of time, a thermal protector will stop it because of the high temperature.

10. Final Check

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

Release the gear clutch with the release key to determine whether or not the gate can be moved manually. If everything is in good working order, tighten the clutch with the key.

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

Adjust the magnet (block) position until the gate opened and closed properly at the limited positions.

The gate operator is installed with a thermal protector, the motor is only designed to work for less than 15 minutes. If is runs continually for an extended period of time, the thermal protector will switch off the motor automatically in case of the temperature is higher than 120°C and switch on the motor when the temperature is lower than 85°C±5°C.

11. Maintenance

Keep operator clean at all times.

Ensure the operator is well earthed, and correctly terminated.

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