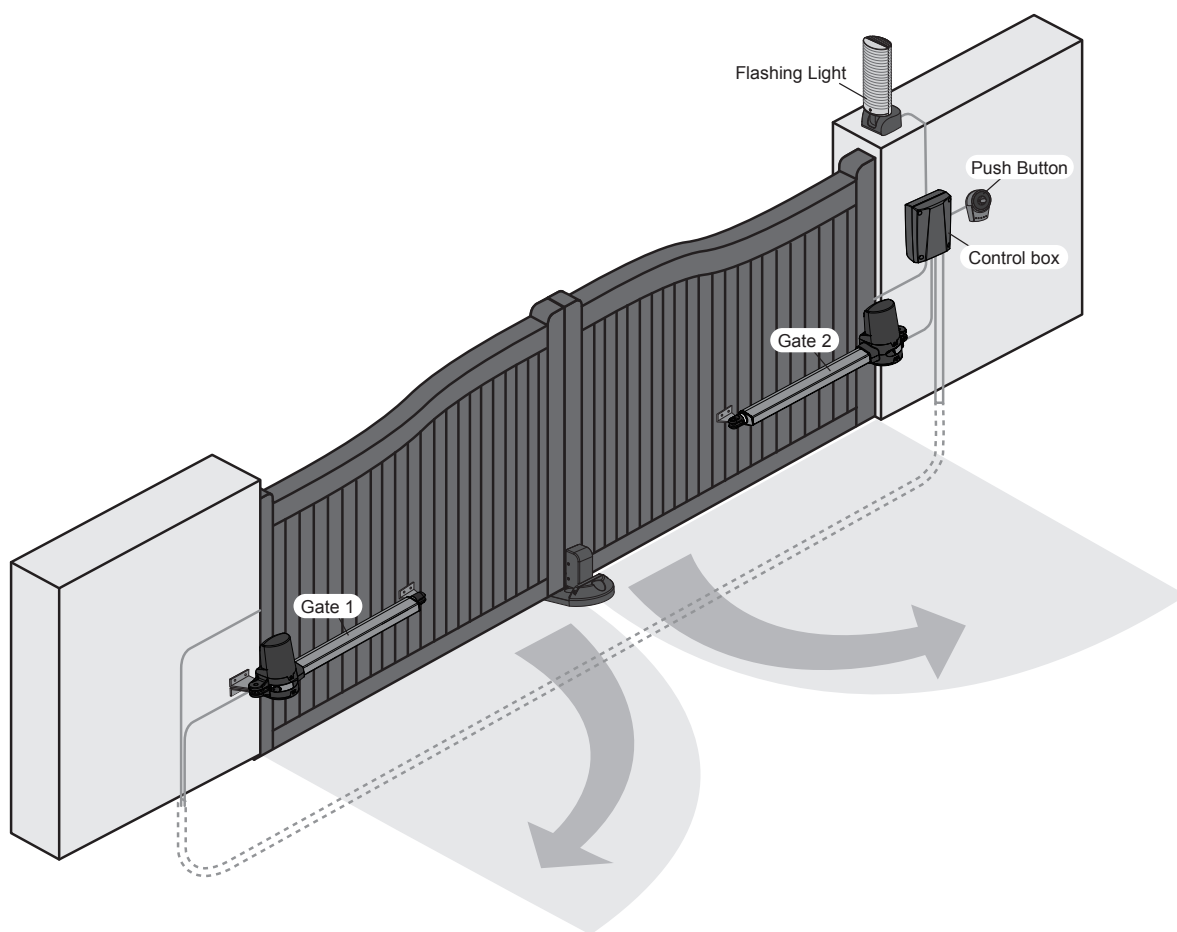


# SWING GATE OPENERS

## 24V DC GEAR MOTOR

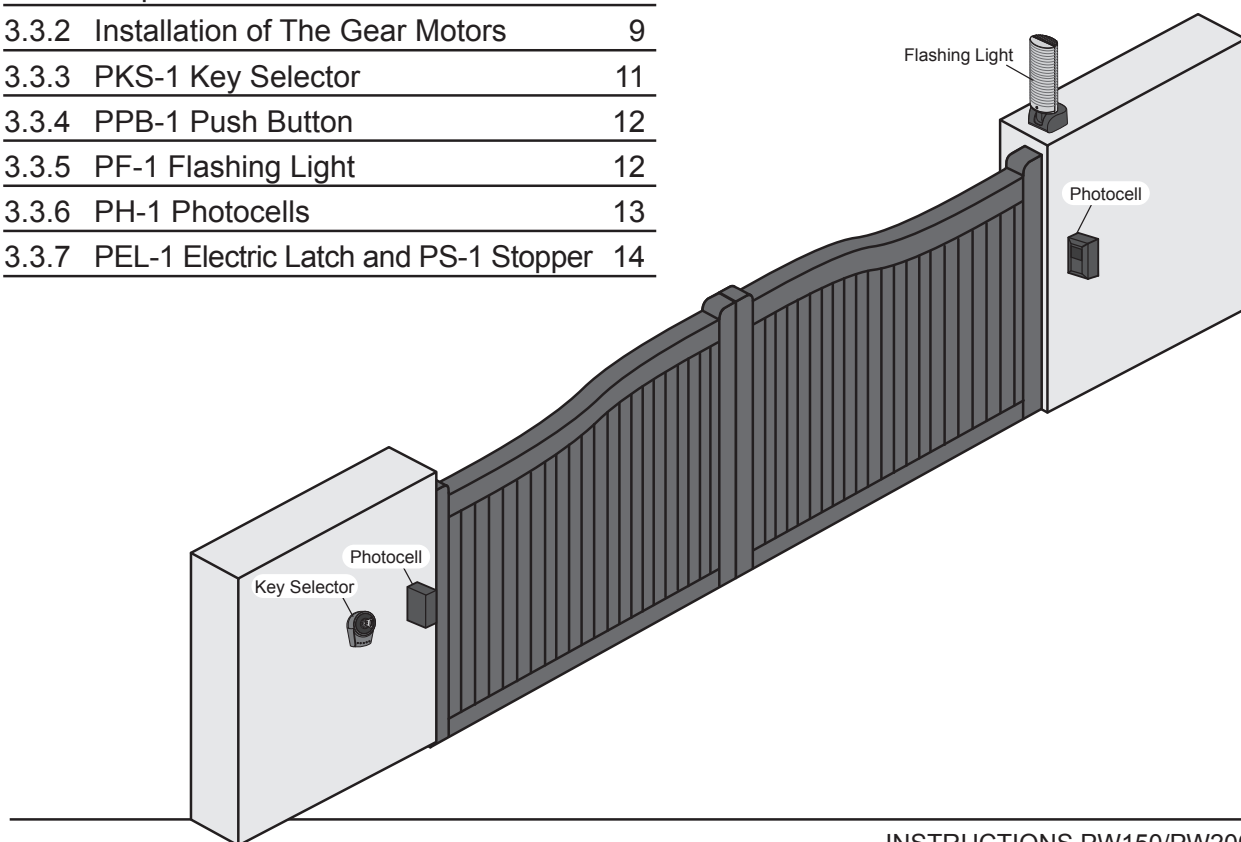
FOR RESIDENTIAL  
**USER MANUAL**





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# 1) Warnings

Please read this instruction manual carefully before the installation of gate-automated system.

This manual is exclusively for qualified installation personnel. Powertech Electronics Inc. is not responsible for improper installation and failure to comply with local electrical and building regulations.

Keep all the components of PW150/PW200 system and this manual for further consultation.

- In this manual, please pay extra attention to the contents marked by the symbol:



- Be aware of the hazards that may exist in the procedures of installation and operation of the gate-automated system. Besides, the installation must be carried out in conformity with local standards and regulations.
- If the system is correctly installed and used following all the standards and regulations, it will ensure a high degree of safety.
- Make sure that the gates works properly before installing the gate-automated system and confirm the gates are appropriate for the application.
- Do not let children operate or play with the gate-automated system.
- Do not cross the path of the gate-automated system when operating.
- Please keep all the control devices and any other pulse generator away from children to avoid the gate-automated system being activated accidentally.

- Do not make any modifications to any components except that it is mentioned in this manual.
- Do not try to manually open or close the gates before you release the gear motor.
- If there is a failure that cannot be solved and is not mentioned in this manual, please contact qualified installation personnel.
- Do not use the gate-automated system before all the procedures and instructions have been carried out and thoroughly read.
- Test the gate-automated system weekly and have qualified installation personnel to check and maintain the system at least every 6-month.

- Install warning signs (if necessary) on the both sides of the gate to warn the people in the area of potential hazards.

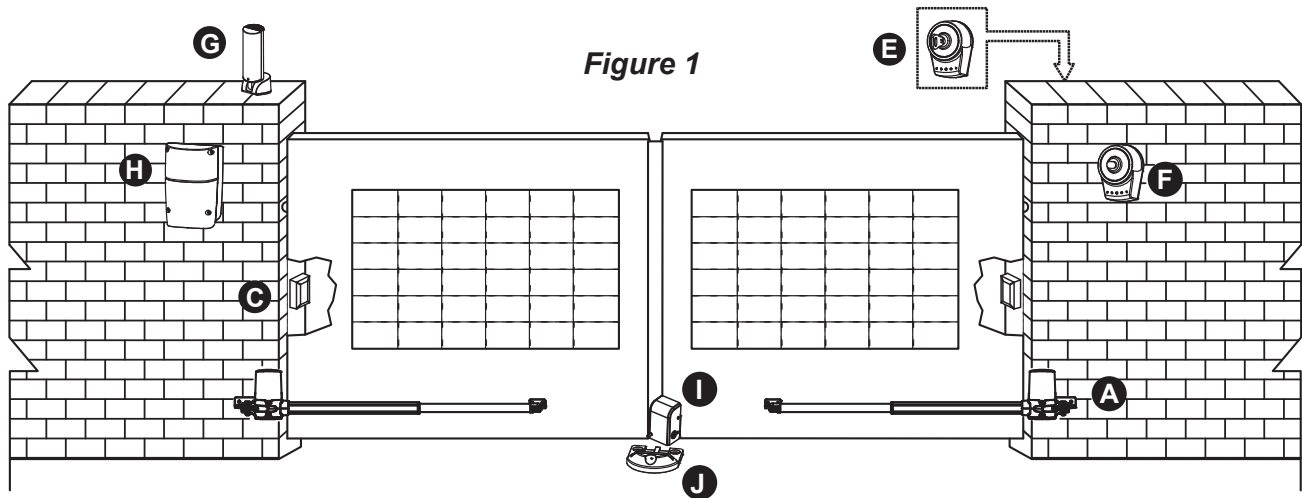
## 2) Product Description and Applications

### 2.1 Applications

PW150/PW200 is applied for residential automation of single or dual leaf gate. PW150/PW200 has to be operated with electricity and it's forbidden to be operated by back-up batteries for normal use. Back-up batteries are only allowed for emergent operation when there is a power failure, and the gear motors can be released by special keys to move the gate manually.

### 2.2 Description of the Automation

The following diagram of PW150/PW200 typical installation describes some terms and accessories of a gate automation system:



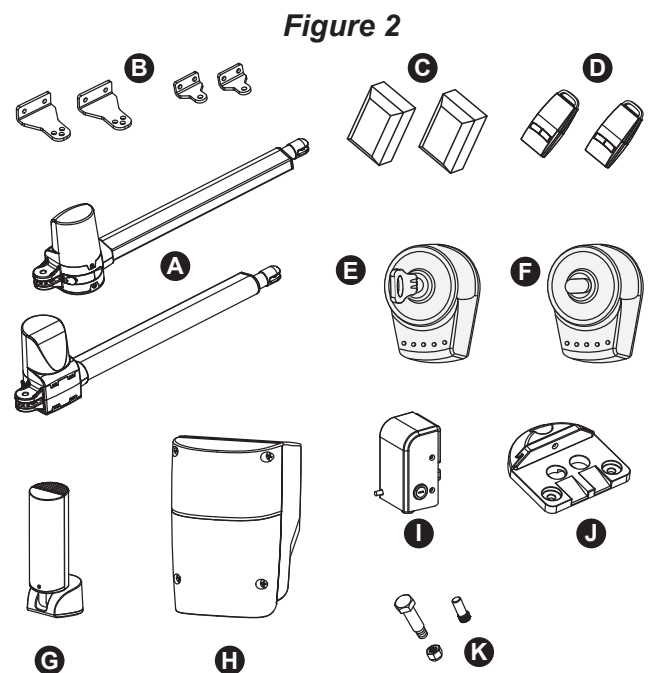
### 2.3 Description of Devices

PW150/PW200 includes the accessories shown in Figure 2.

Please check the accessories the same as the package provided.

**Attention: Some accessories of PW150/PW200 are not included due to local regulations or customized order.**

- A) 2 PW150/PW200 electromechanical gear motors.
  - B) Mounting brackets.
  - C) 1 pair of PH-1 photocells.(one TX and one RX)
  - D) 2 PR-1 radio transmitters.
  - E) 1 PKS-1 key selector with two keys.
  - F) 1 PPB-1 push button switch.
  - G) 1 PF-1 flashing light.
  - H) 1 Control box
  - I) 1 PEL-1 electric latch.
  - J) 1 PS-1 stopper.
  - K) Various small parts: bolts, nuts, etc.
- See Tables 1, 2, 3, 4, 5, 6.**



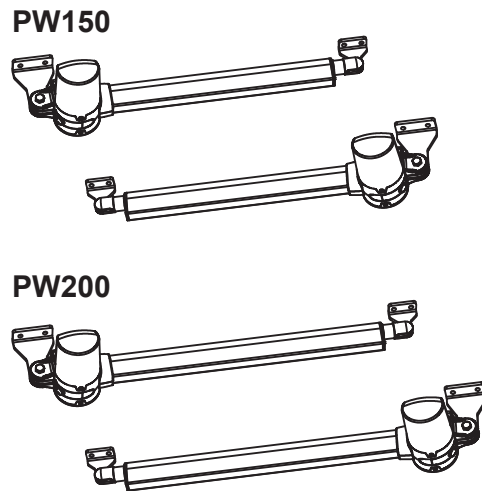
### 2.3.1 PW150/PW200 Electromechanical Gear Motors

PW150/PW200 consists of a worm screw reduction gear and a 24V direct current motor. The gear motor could be released manually by special release keys when there is a power failure.

The gear motor is installed with two post brackets, one rear plate and one front plate for the installation.

Table 1: List of small parts	PW150	PW200
Front bracket	1pce	1pce
Rear bracket	1pce	1pce
M8*40L hex bolt	1pce	1pce
M8 self-locking nut	1pce	1pce
M12 *8L hex bolt	1pce	1pce
M12 Steel bar	1pce	1pce
Release key	2pcs	2pcs

**Figure 3**



### 2.3.2 Control Box

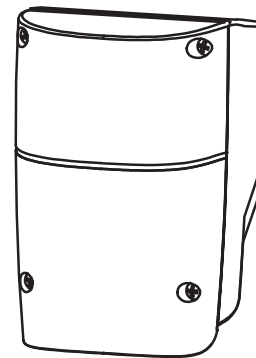
Control box consists of one control panel with incorporated receiver, one transformer and two back-up batteries.

Control box provides the complete automation of the gear motors and other accessories of PW150/PW200 kit.

To connect separate terminals on the control panel and activate the gear motors and other accessories, the installation manual has to be carefully read beforehand.

Table 2: List of small parts for Control Box	Quantity
5*30 Screw	4 pcs
Nylon screw anchor	4 pcs

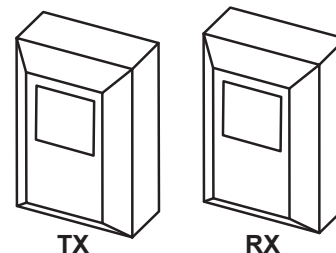
**Figure 4**



### 2.3.3 PH-1 Photocells

The pair of PH-1 photocells has to be installed on the wall and connected to the control panel. The function of the photocells is to detect the obstacles found on the optical axis between the transmitter (TX) and the receiver (RX).

**Figure 5**



### 2.3.4 PR-1 Radio Transmitter

In dual gate installation:

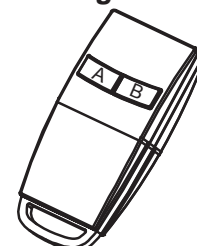
Press the button "A" on the transmitter for dual-gate operation.

Press the button "B" on the transmitter for single-gate operation.

In single gate installation:

Press the button "A" on the transmitter for single-gate operation.

**Figure 6**

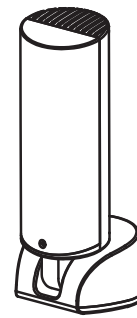


### 2.3.5 PF-1 Flashing Light

PF-1 flashing light is controlled by control box and blinks when the gate is moving. The flashing light stops blinking when the gates finish opening or closing.

Table 2: List of small parts for PF-1	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs

Figure 7

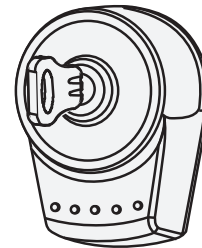


### 2.3.6 PKS-1 Key selector

The PKS-1 key selector is used for opening the gate outdoors without the radio transmitter. PKS-1 key selector is supplied with two keys

Table 3: List of small parts for PKS-1	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs
Keys	2 pcs

Figure 8

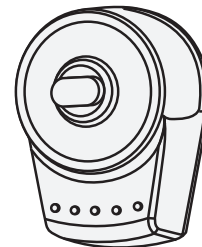


### 2.3.7 PPB-1 Push Button

The PPB-1 push button is used for opening the gate indoors without the radio transmitter.

Table 4: List of small parts for PPB-1	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs

Figure 9

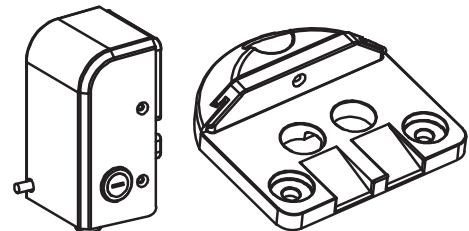


### 2.3.8 PEL-1 Electric Latch and PS-1 Stopper

PEL-1 electric latch is used to lock the gate and it has to be used with PS-1 stopper and installed on the master gate.

Table 6: List of small parts for PEL-1 and PS-1	Quantity
M8*25L hex bolt	3 pcs
M8 self-locking nut	3 pcs
Key	2 pcs

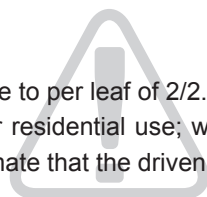
Figure 10



## 3) Installation:

### 3.1 Notes of Motors in Operation

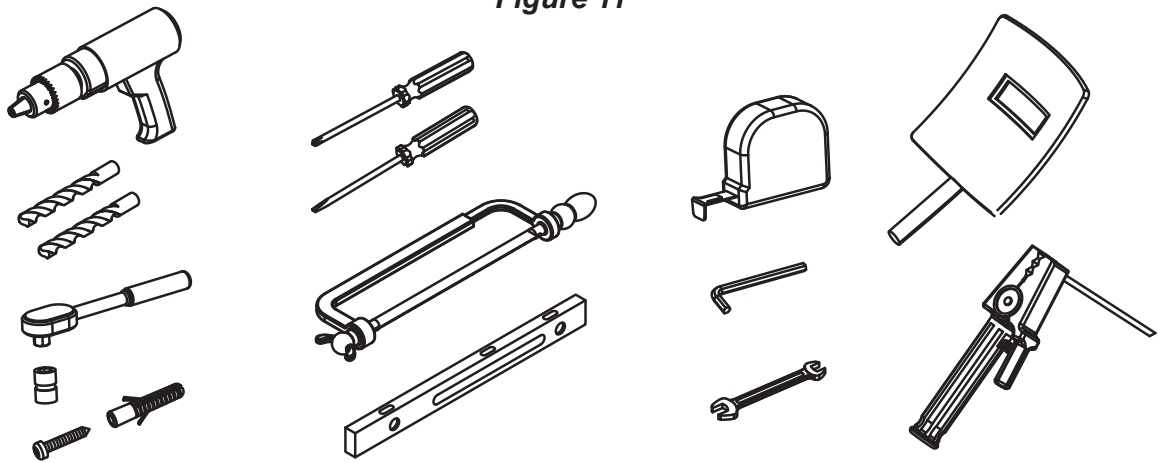
The PW150/PW200 gate openers are applicable to per leaf of 2/2.5 meters in width and 150/200 kg in weight which can be opened up to 110 degrees primarily for residential use; where the performance shall be influenced by the factors such as gate dimension, weight and climate that the driven torque is necessarily to be adjusted properly.



### 3.1.1 Tools in Installing

Please make sure all tools and cables are ready and conform to the industrial safety standard before installation. Please refer to **Figure 11**.

**Figure 11**

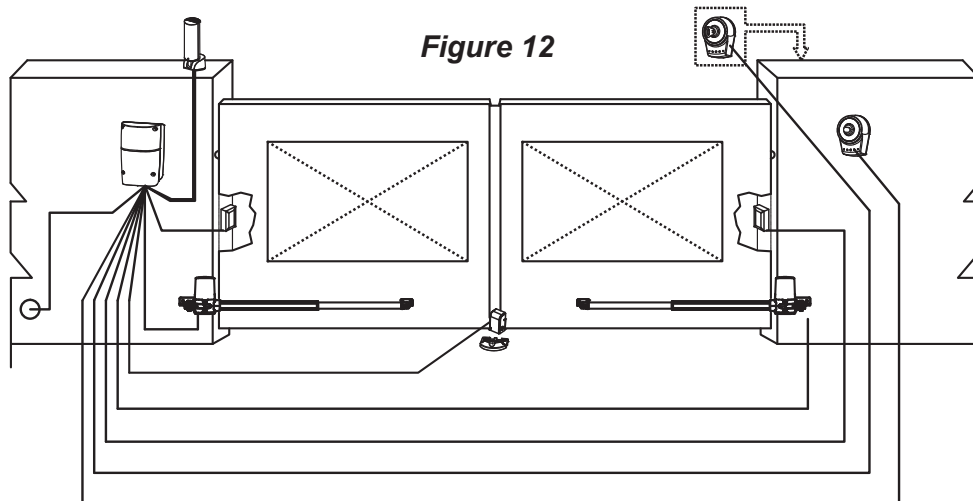


### 3.1.2 Motors, Components and Its Installation in Illustration

The installation procedure of PW150/PW200 may be changed due to various accessories and quantities installed. The basic wiring diagram is shown in **Figure 12**.

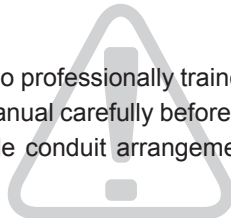
No wiring cables for accessories are supplied with KIT PW150/PW200.

**Figure 12**



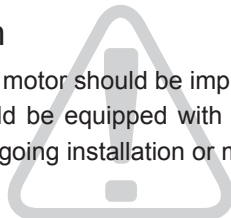
## 3.2 Power Connection

PW150/PW200 requires very low voltage that no professionally trained personnel is required in installation; however, the users are advised to read the installation manual carefully before going for it. After getting to know all accessories and their positions, suggest starting from cable conduit arrangement to prevent the cables from being broken or damaged.



### 3.2.1 Notes for Power Connection

- 1).The installation of power supply cable to the motor should be implemented by a qualified professional electrician.
- 2).The power supply cable of the motor should be equipped with short circuit protection and leakage protection. Please make sure to shut off the power before going installation or maintenance.





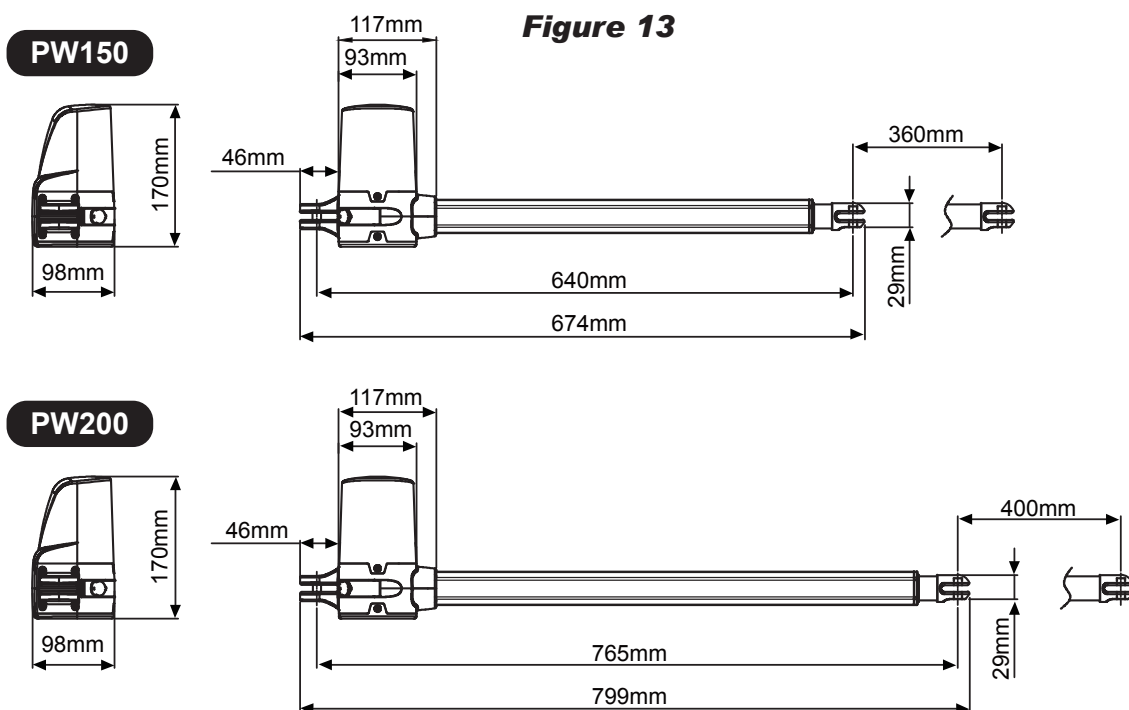
## 3.3 Installation

### 3.3.1 Preparation for Motor Installation

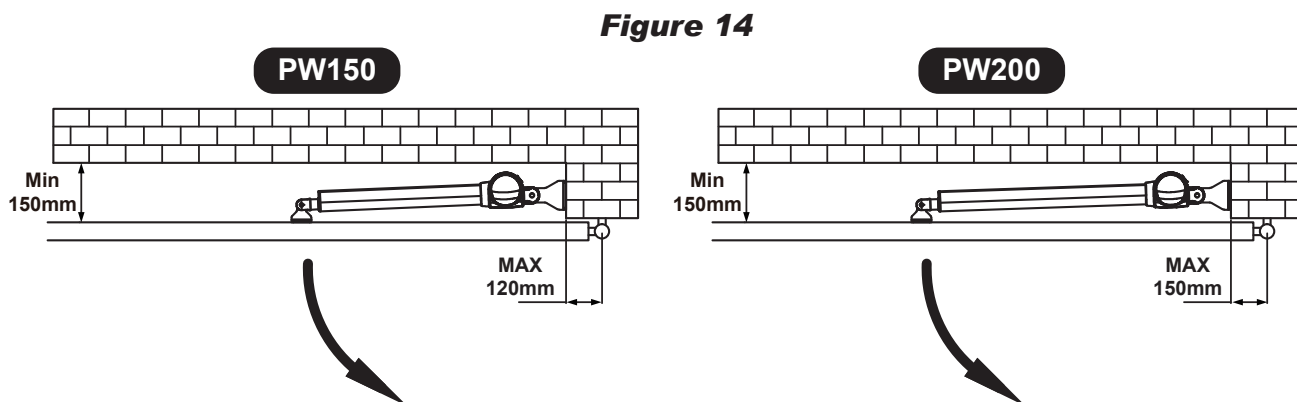
PW150/PW200 is not applicable to a gate which is inefficient or unsafe, neither to solve the defects due to incorrect installation nor poor maintenance.

**Check the following items before going for installation:**

- 1). Make sure the weight and dimensions of the gate conform to the operation range of PW150/PW200. Don't use PW150/PW200 if the gate specifications do not meet the requirements.
- 2). Make sure the gate structure conform to the criteria of automatic operation and force regulations.
- 3). Make sure there is no serious friction existing in the opening or closing travel of the gate leaves.
- 4). Make sure the gate is at horizontal level that the gate will not move aside at any position.
- 5). Make sure the gate can bear the impact of the motor torque when it is installed on any hole of the bracket which the surface is sufficiently sturdy.
- 6). Make sure the photo sensors are installed on flat surfaces to ensure the two ends of receiving and transmitting corresponded to each other.
- 7). Check the dimensions of the motors as below.

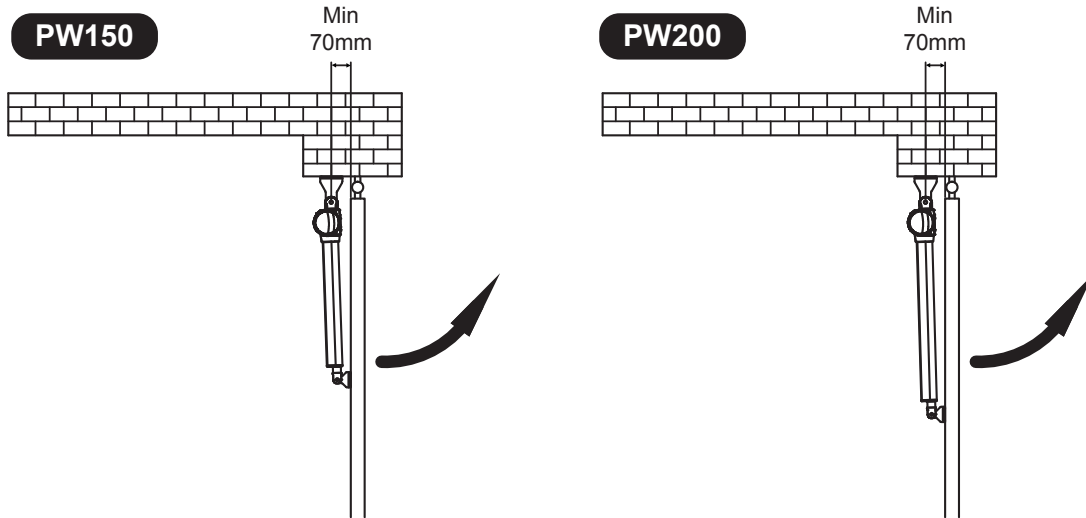


- 8). Make sure to leave enough space when the gate is opening.



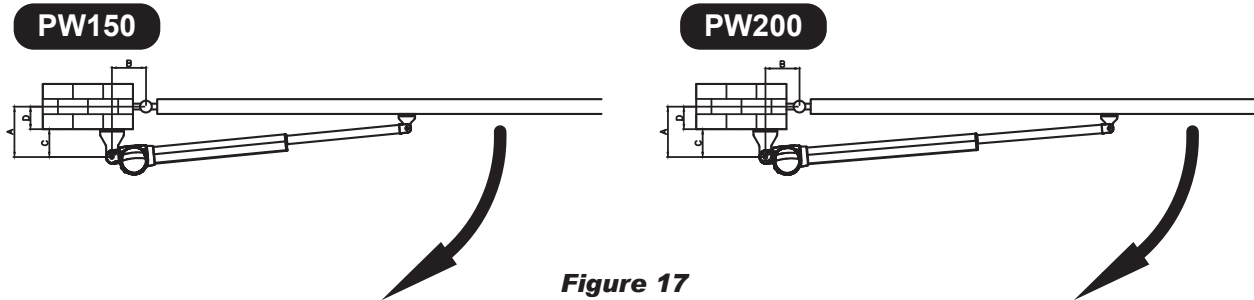
9). If the gate is OPENED OUTWARD, please leave at least 70mm between the post brackets and the gate.

**Figure 15** (Aerial View)

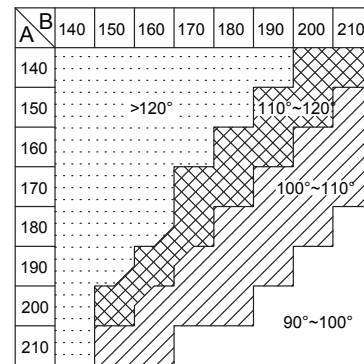
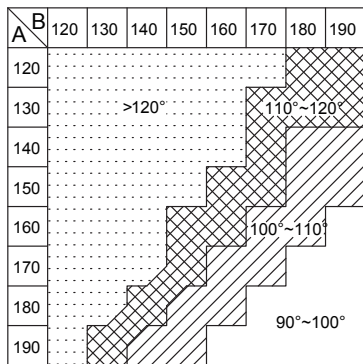


10). Using the leaf-opening angle as criteria to make sure all criteria in **Figure 17** can be met.

**Figure 16** (Aerial View)



**Figure 17**



11). "C" value is 139mm.

12). "D" can be measured from the gate easily.

13). "A" = "C" + "D"

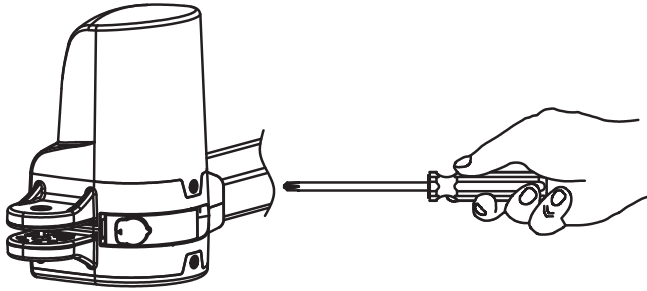
14). The value of "B" can be calculated from the value of "A" and the leaves opening angle. Ex. If "A"=160mm with the leaves opening angle of 100 degrees, then the value of "B" is approximate 190mm.

**\*\*Please make sure "B" and "A" are similar or the same in value that the leaves can be operated smoothly, also to reduce the burden of the motor.**

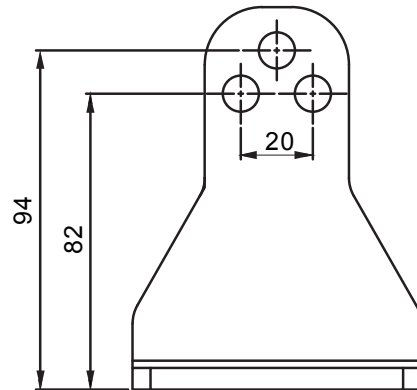
### 3.3.2 Installation of The Gear Motors

- 1). Choose the correct dimensions of the motors and position to be installed.
- 2). Check if the mounting surface the brackets to be installed is smooth, vertical and rigid.
- 3). Arrange the cable conduit for power supply cable of the motors.
- 4). Loosen the screw and remove the cover of the motor as shown in **Figure 18**.
- 5). Place the leaves in the closed position.
- 6). Refer to the distance of "B" in **Figure 17**, place the rear plate in the correct position on the mounting surface. Inspect if the distance is proper as shown in **Figure 22** i.e. the position the front plate of the motor to be installed.

**Figure 18**

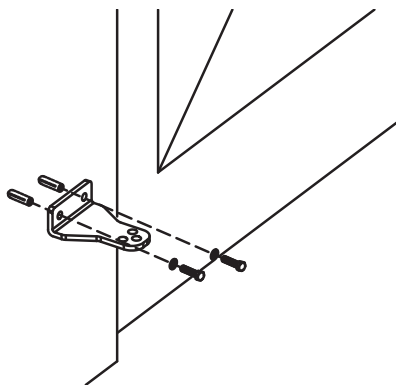


**Figure 19**

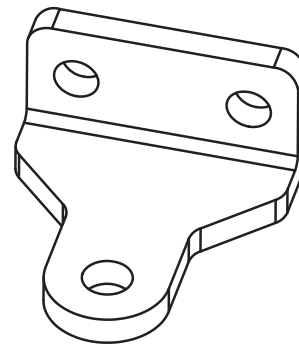


- 7). Place two post brackets on the surface to be installed and mark the drilling points, then drill minimum diameter of 8mm holes by four on the mounting surface to be installed and fasten up the brackets with screws and washers.
- 8). Please make sure the front plate is completely installed horizontally.

**Figure 19**

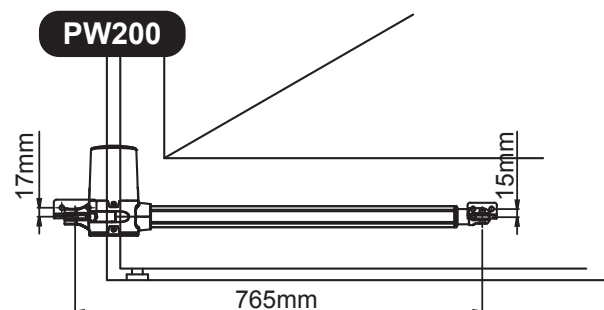
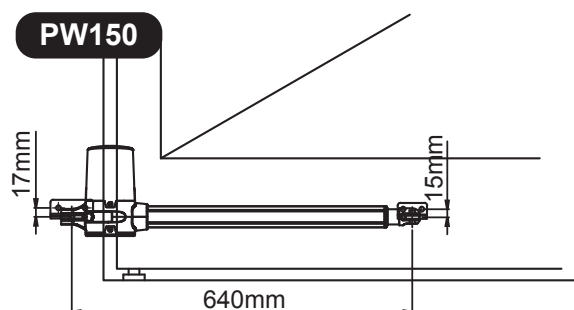


**Figure 20**



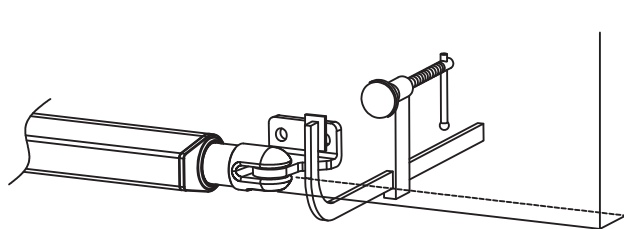
- 9). Refer to **Figure 22**, the distance between front plate of the motor and rear plate is 640mm (PW150) / 798mm (PW200), the difference in height is 15mm (PW150) / 155mm (PW200).

**Figure 22**

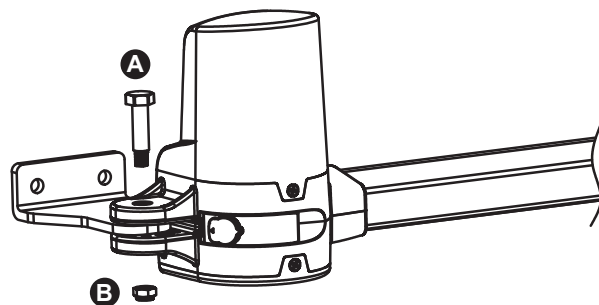


- 10). Clamp and fix the motor front plate on the door temporarily.
- 11). Lift up the motor and insert the screws into the front plate.
- 12). Lift the motor overhead and push the gate to the end until the screw holes of the motor end matches the holes on the rear plate. Fasten the motor to the rear plate with the bolt as shown in **Figure 24**.

**Figure 23**

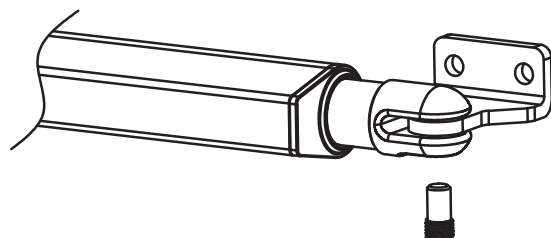


**Figure 24**

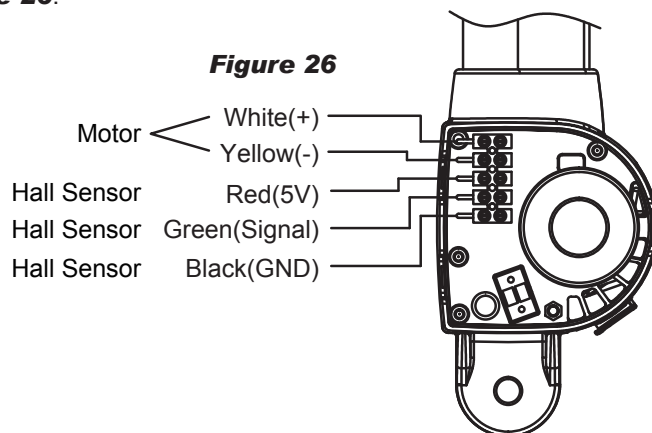


- 13). Fasten the nut tightly and loosen it for half round for motor supporting in rotating.
- 14). Fasten the motor front end to the front plate with the bolt **A** and nut **B** tightly. Fully tighten the screw.
- 15). Use appropriate release key to release the gear motor.
- 16). Try to push the released gate and make sure the motor can be manually moved easily.
- 17). Make sure the motor front plate can be fastened on the gate to be installed permanently.
- 18). Use the appropriate release key to fasten the gear motor again.
- 19). Loosen the plastic nut under the power cable of the motor end, and penetrate the power cable through the nut and screw it up.
- 20). Connect the motor power cable as shown in **Figure 26**.

**Figure 25**

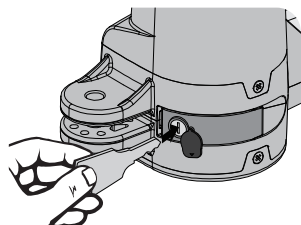


**Figure 26**

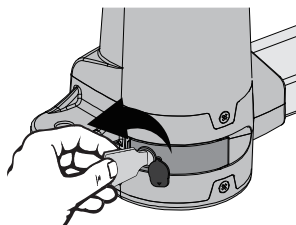


- 21). Gear Motor Release (for left motor)
  - 1). Insert the release key to the release slot **Figure 27**.
  - 2). Turn the release key anti-clockwise **Figure 28**.
  - 3). Pull out the release bar **Figure 29**.
  - 4). Turn the release key clockwise to fix the release bar, the release bar has to be in pulled out position when you turn the release key clockwise **Figure 30**.
  - 5). The turning direction will be reversed for right motor.

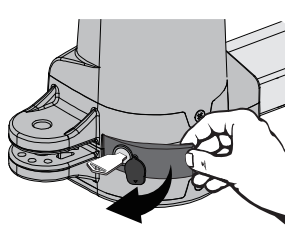
**Figure 27**



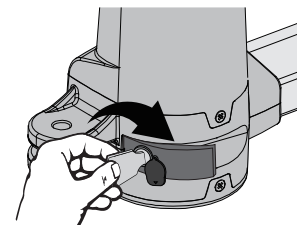
**Figure 28**



**Figure 29**



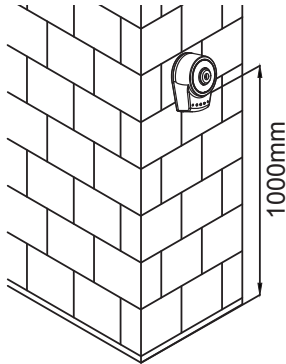
**Figure 30**



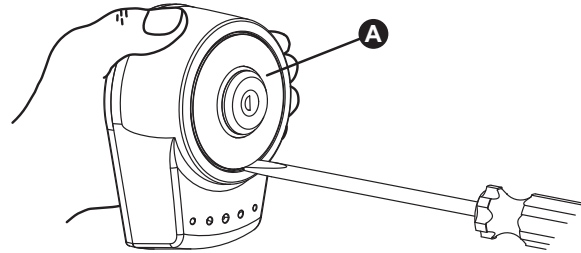
### 3.3.3 PKS-1 Key Selector

- 1). PKS-1 key selector is installed outside and close to the gate at the height of about 100cm, so that it could be used by most people. Decide the installation position of PKS-1 first. See **Figure 3.3.3 (1)**.
- 2). Remove the round cover (A) by prizing it out with a screwdriver. See **Figure 3.3.3 (2)**.
- 3). Unscrew the two screws beside the lock body. See **Figure 3.3.3 (3)**.
- 4). Turn the key and separate the bottom of the shell with the lock body. See **Figure 3.3.3 (4)**.

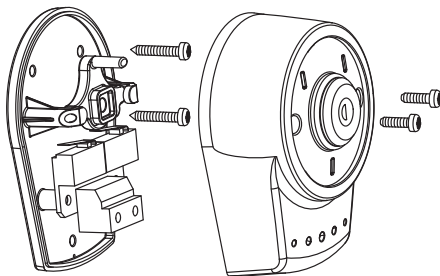
**Figure 3.3.3 (1)**



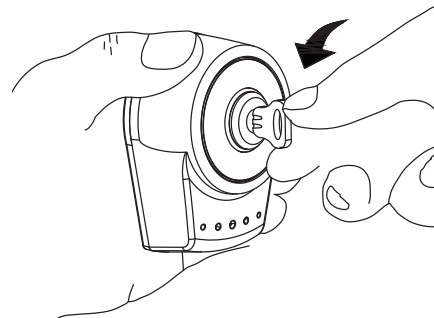
**Figure 3.3.3 (2)**



**Figure 3.3.3 (3)**

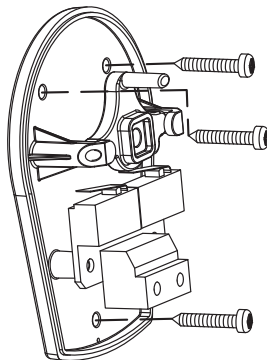


**Figure 3.3.3 (4)**

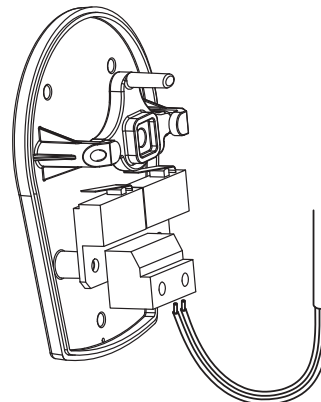


- 5). Breach the three holes at the bottom and mark the points by the holes as reference.
- 6). Drill the holes in the wall and fix the bottom to the wall by three screws. See **Figure 3.3.3 (5)**.
- 7). Connect the electric wires to the terminals as shown in **Figure 3.3.3(6)**, and it's not required to distinguish any polarity. The terminals can be removed for connecting the wires easily.
- 8). Turn the key and insert the shell on the bottom. Turn the key back to the center position and the shell will be fixed to the bottom.
- 9). Tighten the lock body with the two screws and insert the round cover by pressing it to attach to the whole unit.

**Figure 3.3.3 (5)**



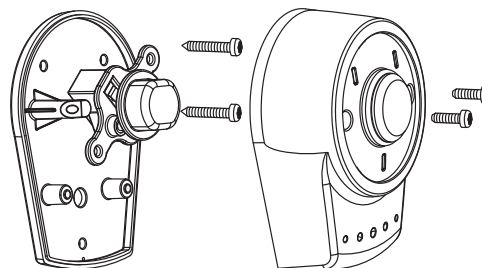
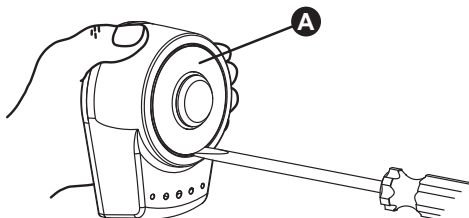
**Figure 3.3.3 (6)**



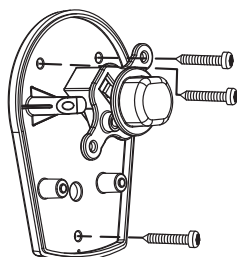
### 3.3.4 PPB-1 Push Button

- 1). PPB-1 push button is installed indoors at the height of about 100cm, so that it could be used by most people.
- 2). Remove the round cover (A) by prizing it out with a screwdriver. See **Figure 3.3.4 (1)**.
- 3). Unscrew the two screws beside the button.
- 4). Separate the upper shell with the bottom. See **Figure 3.3.4 (2)**.
- 5). Breathe the three holes at the bottom and mark the points by the holes as reference.
- 6). Drill the holes in the wall and fix the bottom to the wall by three screws. See **Figure 3.3.4 (3)**.
- 7). Connect the electric wires to the terminals as shown in Figure 3.3.4 (4), and it's not required to distinguish any polarity. The terminals can be removed for connecting the wires easily.
- 8). Attach the upper shell to the bottom and screw them up by two screws and insert the round cover by pressing it to attach to the whole unit.

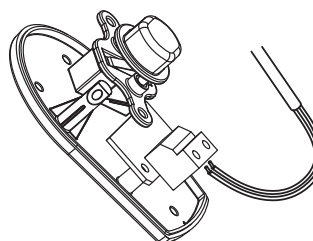
**Figure 3.3.4 (1)**



**Figure 3.3.4 (3)**



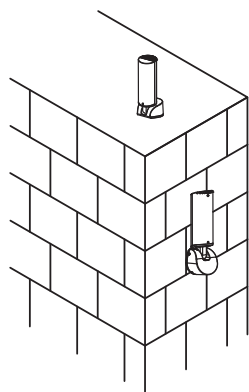
**Figure 3.3.4 (4)**



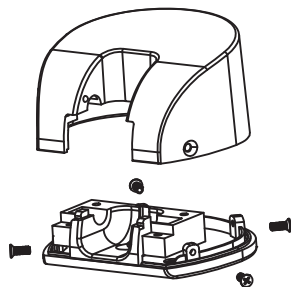
### 3.3.5 PF-1 Flashing Light

- 1). Decide the installation position of the flashing light. The flashing light has to be installed near the gate and easy to be seen by users and passersby. The flashing light can be installed horizontally or vertically. See **Figure 3.3.5 (1)**.
- 2). Unscrew the four screws on the light base and separate the base with the bottom as shown in **Figure 3.3.5 (2)**.
- 3.) Connect the wires and penetrate the wires into the hole of the base. See **Figure 3.3.5 (3)**.
- 4.) Drill the holes in the wall and fix the bottom to the wall by three screws. See **Figure 3.3.5 (4)**.

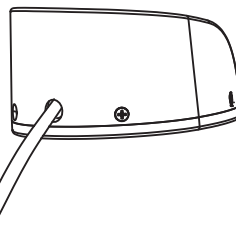
**Figure 3.3.5 (1)**



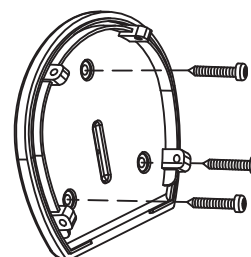
**Figure 3.3.5 (2)**



**Figure 3.3.5 (3)**

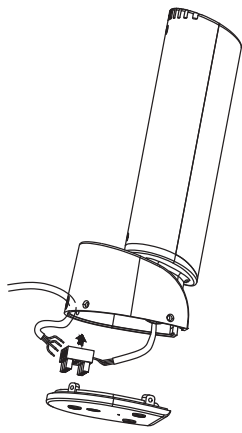


**Figure 3.3.5 (4)**

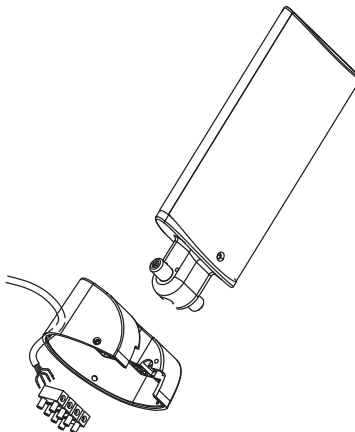


- 5). Connect the four wires of the light and the antenna to the PCB terminals and place the wires into the conduit if necessary. See **Figure 3.3.5 (5)**.
- 6). Tighten the four screws back on the light base. **Figure 3.3.5 (6)**
- 7). Replacing the bulb set. See **Figure 3.3.5 (7)**
  - 7.1) Unscrew the flashing light wires from the PCB terminals and make sure the power of the light is off.
  - 7.2) Release the three screws (A) \ (B) \ (C) of the flashing light cover.
  - 7.3) Separate the flashing light cover and replace the bulb set with a new one.
  - 7.4) Tighten the three screws (A) \ (B) \ (C) of the flashing light cover.

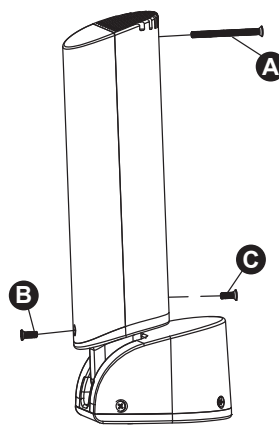
**Figure 3.3.5 (5)**



**Figure 3.3.5 (6)**



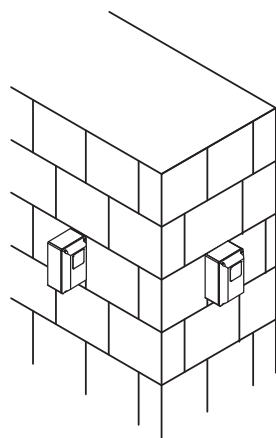
**Figure 3.3.5 (7)**



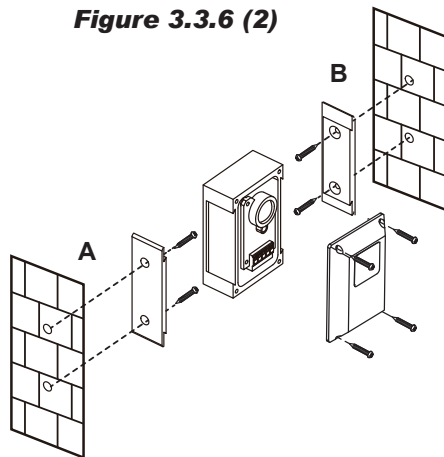
### 3.3.6 PH-1 Photocells

- 1). Decide the installation position of the photocells. See **Figure 3.3.6 (1)**.
- 2). Unscrew the screws and secure the photocells on the post A, B or C. See **Figure 3.3.6 (2)** and **(3)**.

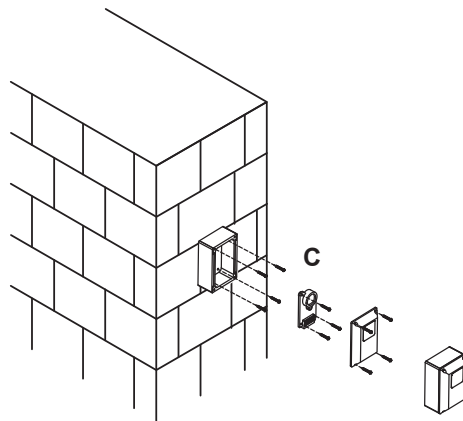
**Figure 3.3.6 (1)**



**Figure 3.3.6 (2)**



**Figure 3.3.6 (3)**



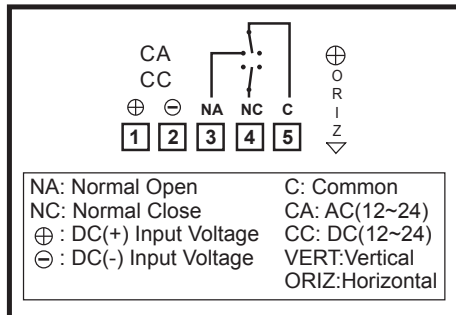


3). Wiring connection:

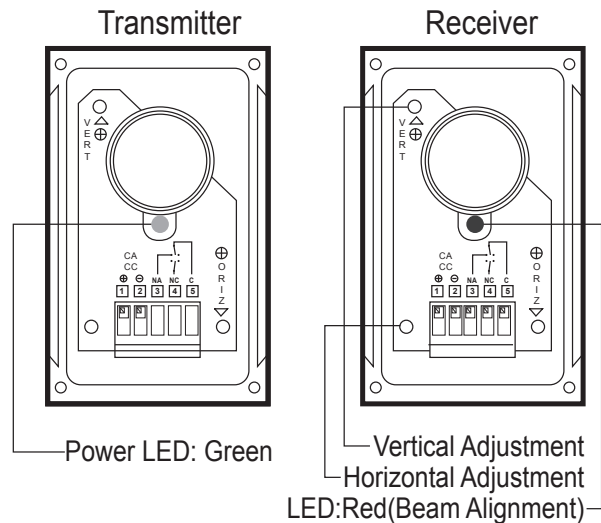
TX: Connect the (1) and (2) terminals on the transmitter with the terminals GND and 24V on the PL600/ 1000 PCB.

RX: Connect the (1), (2) and NC terminals on the receiver with the terminals GND , 24V and PH1 on the PCB600/1000 PCB. See **Figure 3.3.6 (4)** **Figure 3.3.6 (5)**.

**Figure 3.3.6 (4)**



**Figure 3.3.6 (5)**



### 3.3.7 PEL-1 Electric Latch and PS-1 Stopper

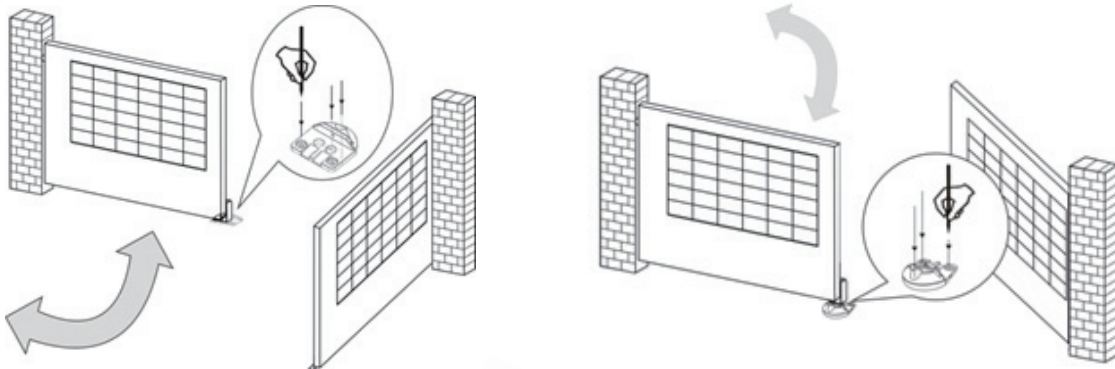
1. Stopper:

1). Before installing the stopper, please make sure the gates are in close positions and the surface to be installed is flat.

2). Place the stopper on the ground using the bottom as reference, and mark the 3 drilling points.

See **Figure 3.3.7 (1)** For the gate opened inward.

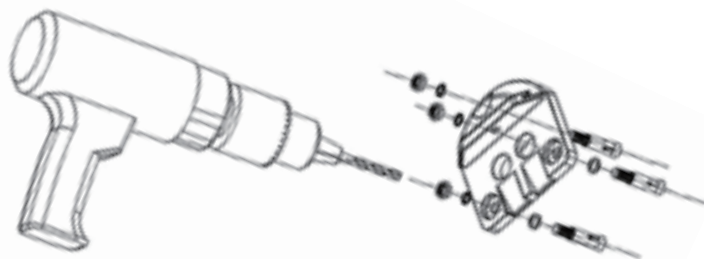
See **Figure 3.3.7 (2)** For the gate opened outward.



Note: If the gate is opened outward, place the stopper in opposite direction.

3). Drill the 3 marked points, and then securely attach the stopper to the ground with screws and washers.

See **Figure 3.3.7 (3)**





2. Electric Latch:

(If the gate is opened outward)

1). If the gate is opened outward, please change the spring inside and screw it in the different place.

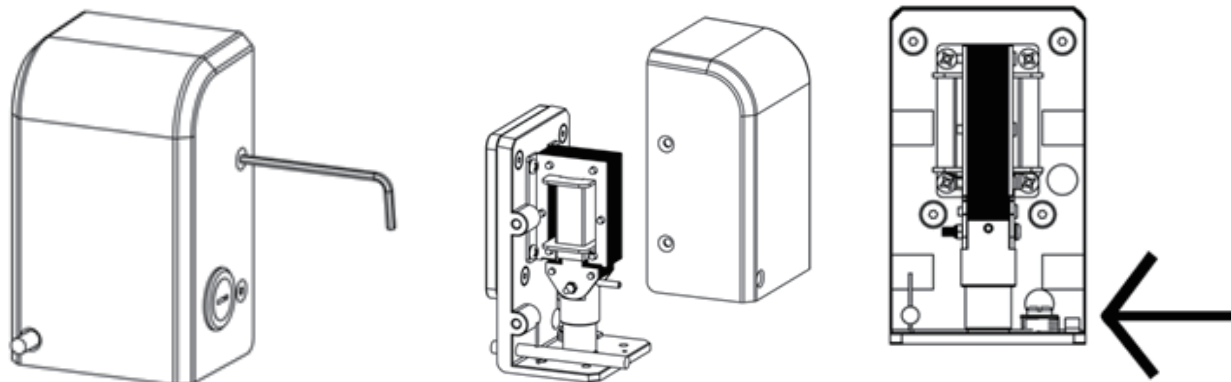
See **Figure 3.3.7 (4)**, **Figure 3.3.7 (5)**, **Figure 3.3.7 (6)** & **Figure 3.3.7 (7)**

**Figure3.3.7(4)** Unscrew the screws.

**Figure3.3.7(5)** Take the casing off.

**Figure3.3.7(6)**

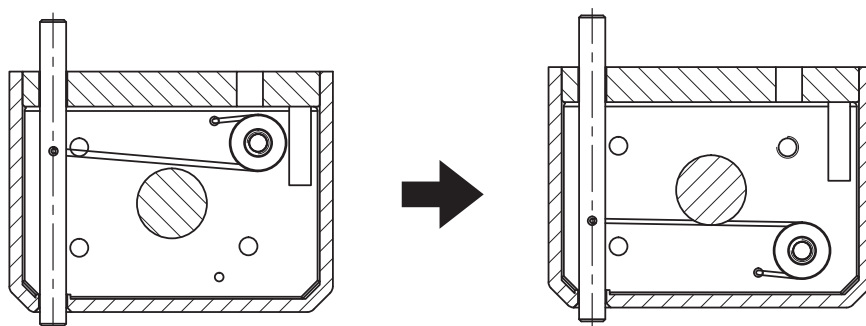
The location of the spring.



**Figure3.3.7(7)**

(Installation)

Change the spring and screw it in the different place.

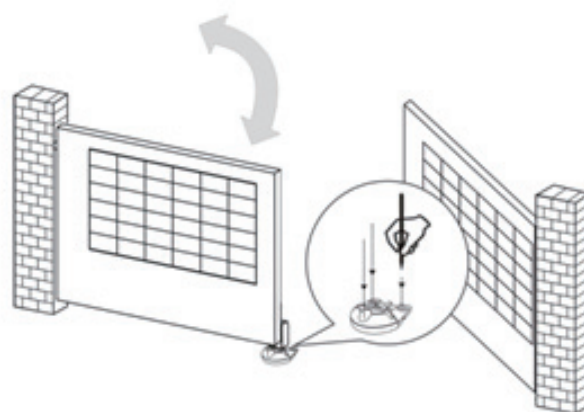
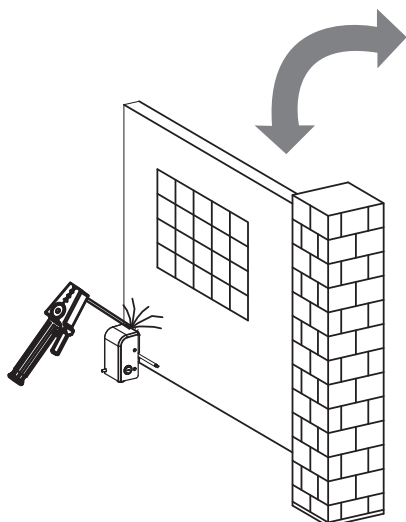


2). Weld the back plate of the electric latch to the surface on the master gate. See **Figure 3.3.7 (8)**.

Please avoid melting the wires by the heat of the fixed plate.

**Figure3.3.7(8)** For the gate opened inward.

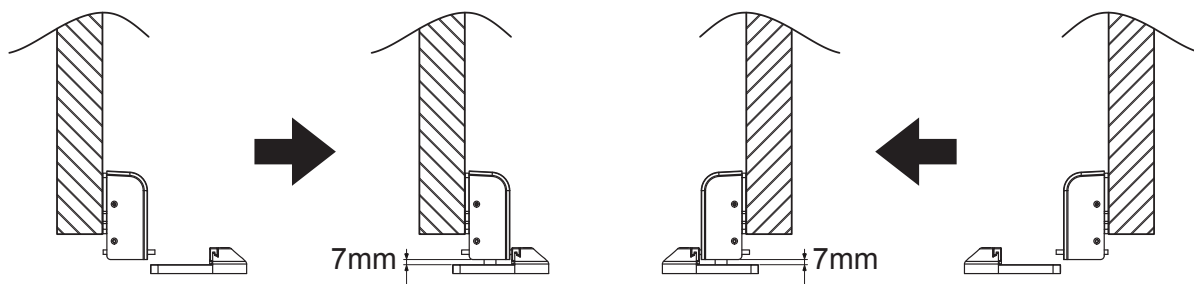
**Figure3.3.7(9)** For the gate opened Outward.



3). The gap between the bottom of electric latch and the stopper should be less than 7mm. See **Figure 3.3.7 (10)**

**Figure 3.3.7(10)** For the gate opened inward.

**Figure 3.3.7(11)** For the gate opened Outward.



4). Connect the wires of the electric latch to the terminal LATCH and GND on the PCB.

## 4) Technical Characteristics

### 4.1/4.2 PW150 / PW200

	PW150	PW200
<b>Motor</b>	24Vdc motor with mechanical release	24Vdc motor with mechanical release
<b>Gear type</b>	Worm gear	Worm gear
<b>Thrust</b>	1500N	2000N
<b>Stroke length</b>	360mm	400mm
<b>Power supply</b>	24Vdc	24Vdc
<b>Maximum operating current</b>	4.2A for maximum 10 seconds.	4.2A for maximum 10 seconds.
<b>Maximum gate weight</b>	150 kg per leaf	200 kg per leaf
<b>Maximum gate length</b>	2 meters	2.5 meters
<b>Duty cycle</b>	20%	20%
<b>Operating Temperature</b>	-20°C~+50°C	-20°C~+50°C
<b>Dimension</b>	674mm * 98mm * 170mm	799mm * 98mm * 170mm
<b>Weight</b>	3.1kg	3.6kg

### 4.3 PH-1 Photocells

<b>Detection type</b>	Through beam
<b>Operating distance</b>	30 meters
<b>Response time</b>	100ms
<b>Input voltage</b>	AC/DC 12~24V
<b>Operating Temperature</b>	-20°C~+60°C
<b>Protection class</b>	IP66
<b>Dimension</b>	59mm * 87mm * 38mm

### 4.4 PKS-1 Key Selector

<b>Application</b>	For outdoor use
<b>Installation</b>	Wall mounted vertically
<b>Operating Temperature</b>	-20°C~+50°C
<b>Dimension</b>	85mm*60.5mm*40.5mm

### 4.5 PPB-1 Push Button

<b>Application</b>	For outdoor use
<b>Installation</b>	Wall mounted vertically
<b>Operating Temperature</b>	-20°C~+50°C
<b>Dimension</b>	85mm*60.5mm*40.0mm

#### 4.6 PF-1 Flashing Light

<b>Application</b>	For warning purpose during leaves movement
<b>Lamp</b>	24Vdc Halogens bulb
<b>Operating Temperature</b>	-20°C~+50°C
<b>Installation</b>	horizontally or vertically installed
<b>Dimension</b>	205mm * 80mm * 75mm

#### 4.7 PR-1 Radio Transmitter

<b>Application</b>	Radio transmitter for remote control of PW220/PW230
<b>Frequency</b>	433.92Mhz
<b>Coding</b>	Rolling code
<b>Buttons</b>	2, for single-gate or dual-gate operation
<b>Power Supply</b>	3V with one CR2032 button type lithium battery
<b>Operating Temperature</b>	-20°C~+50°C
<b>Dimension</b>	71.5mm * 33mm * 14mm

#### 4.8 PEL-1 Electric Latch

<b>Application</b>	For locking the gate.
<b>Power Supply</b>	24Vdc
<b>Operating Temperature</b>	-20°C~+50°C
<b>Operating Current</b>	5A
<b>Dimension</b>	61mm * 55mm * 120mm

# Declaration of Conformity

**Applicant: Powertech Electronics Inc.**

**Manufacturer: Timotion Technology Co., Ltd.**

**Address: Shiyong Mining Industrial Zone, Hengli Town, DongGuan City, GuangDong, China**

**Model: PW150; PW200; PR-1**

1. Certificate of conformity of a product with the essential requirements art. 3.2 of the R&TTE Directive 1999/5/EC.
2. The above product has been tested with the listed standards and in compliance with the European Directive LVD 2006/95/EC.
3. The submitted sample of the above product has been tested for CE marking according to the following European Directives: 2006/42/EC Machinery Directive.

**Comply with the following Standards:**

EN 301489-1 V1.8.1: 2008

EN 301489-3 V1.4.1: 2002

EN 300220-1 V2.1.1: 2006

EN 300220-2 V2.1.2: 2007

EN 60335-1: 2002+A11:2004+A1:2004+A12:2006+A2:2006+A13:2008

EN 60335-2-103: 2003

EN 62233: 2008

EN 12445: 2001

EN 12453: 2001

And also declare that the machinery may not be put into service until the machine, which will be integrated or become one of the components, and announced to comply with the provisions as the required.

Taiwan, November 20, 2011

**David Lan**



(Deputy Managing Director)