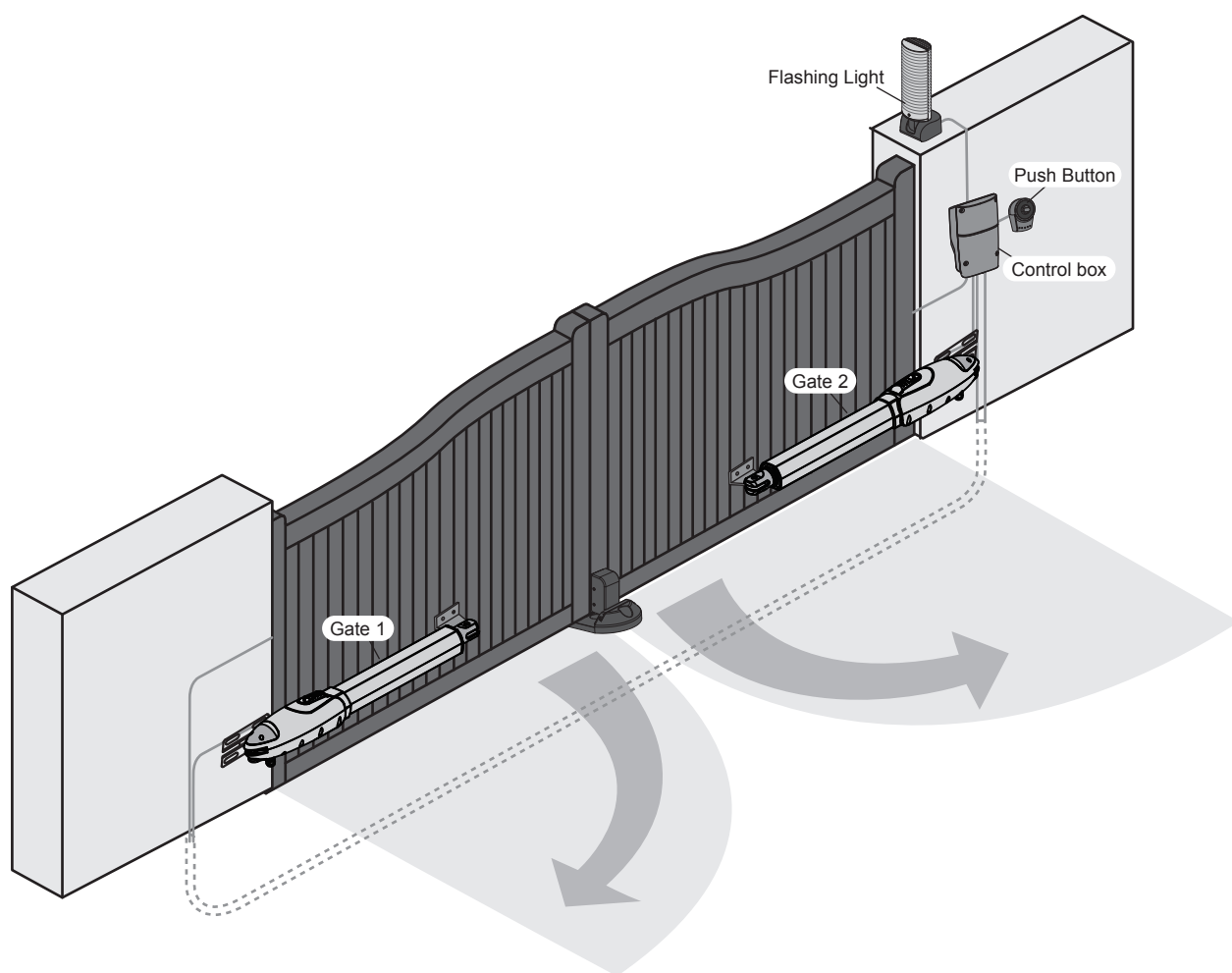


# SWING GATE OPENERS

24V DC GEAR MOTOR

FOR RESIDENTIAL  
USER MANUAL



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## 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.

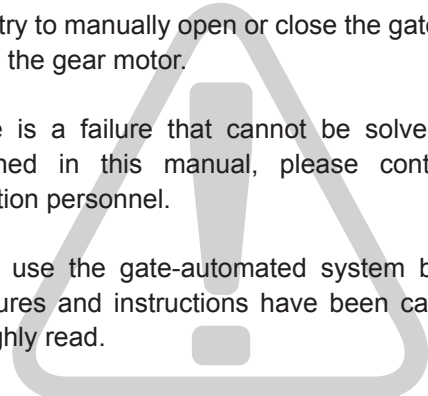
Keep all the components of PW220/230 system and this manual for further consultation.

- 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.



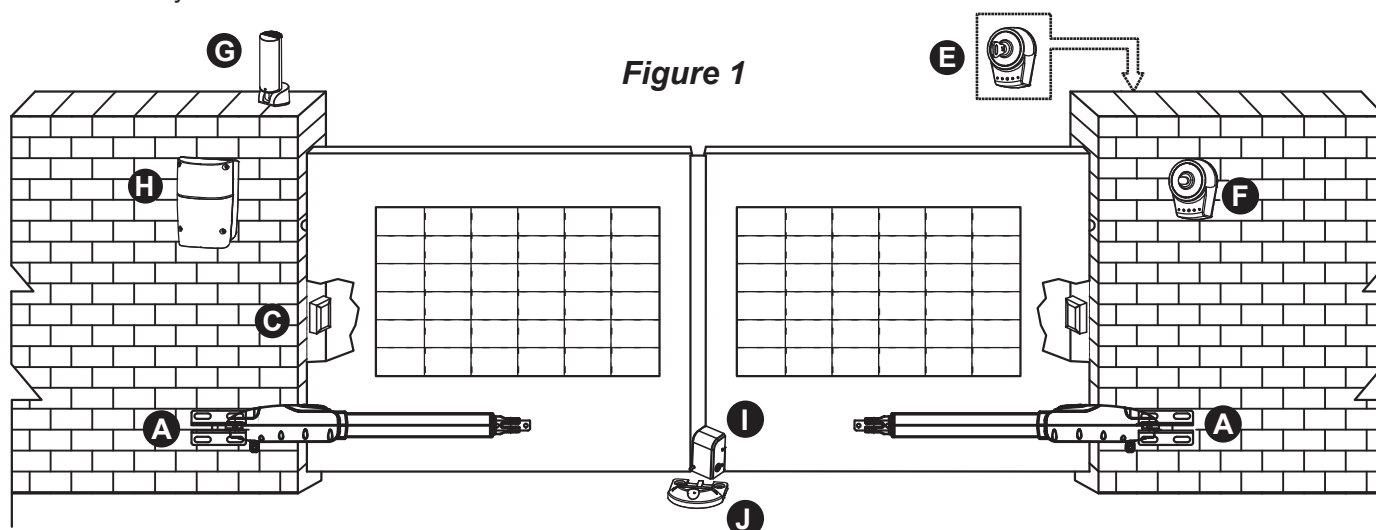
# 1) Product Description and Applications

## 1.1 Applications

PW220/PW230 is applied for residential automation of single or dual leaf gate. PW220/PW230 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.

## 1.2 Description of the Automation

The following diagram of PW220/PW230 typical installation describes some terms and accessories of a gate automation system:



## 1.3 Description of Devices

PW220/PW230 includes the accessories shown in Figure 2.

Please check the accessories the same as the package provided.

**Attention: Some accessories of PW220/PW230 are not included due to local regulations or customized order.**

A) 2 PW220/PW230 electromechanical gear motors with mounting brackets.

B) 2 release keys.

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.

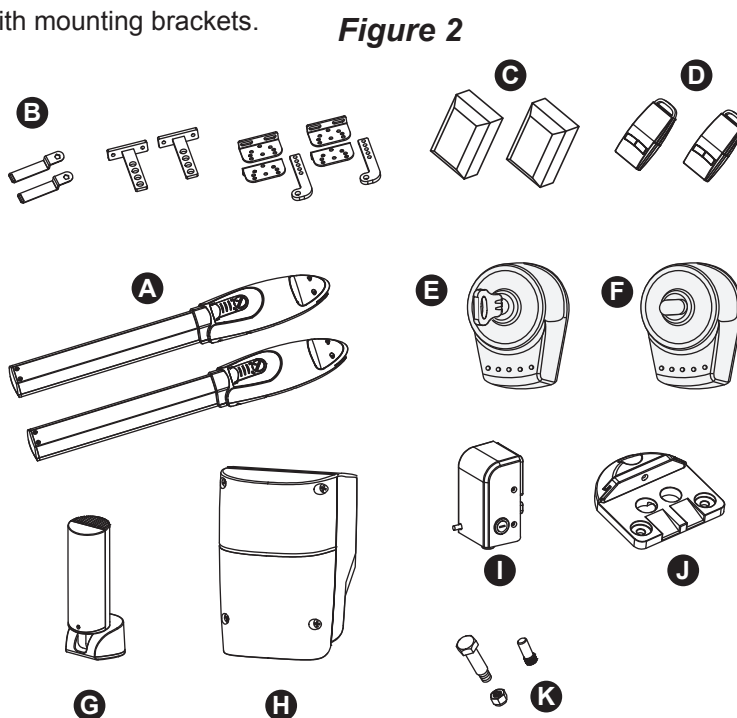
H) 1 Control box

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.



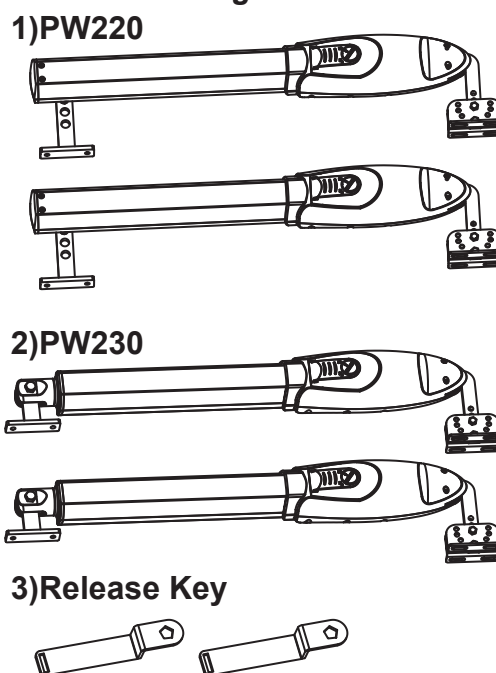
### 1.3.1 PW220/PW230 Electromechanical Gear Motors

PW220/PW230 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	PW220	PW230
Front plate	2pcs	2pcs
Rear plate	4pcs	2pcs
Post bracket	4pcs	4pcs
M8*25L hex bolt	4pcs	4pcs
M8 self-locking nut	2pcs	4pcs
M12 *25L hex bolt	0	2pcs
M12 self-locking nut	2pcs	2pcs
Release key	2pcs	2pcs

**Figure 3**



### 1.3.2 Control Box

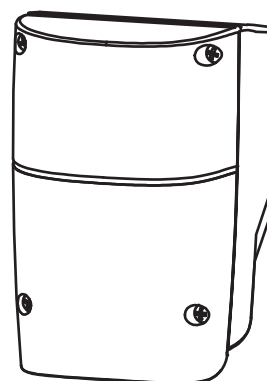
Control box consists of one control panel with incorporated receiver, one transformer and two back-up batteries.

Provides the complete automation of the gear motors and other accessories of PW220/PW230 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

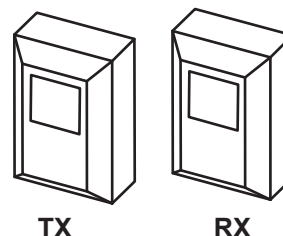
**Figure 4**



### 1.3.3 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).

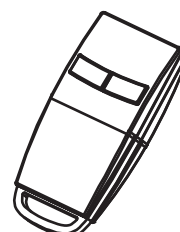
**Figure 5**



### 1.3.4 PR-1 Radio Transmitter

PR-1 radio transmitter is used for the remote control of the gate movement. To use the transmitter, press and hold the button for 1 second. There are two buttons on the transmitter and (A) button is “**open-stop-close mode**” and (B) button is “**pedestrian mode**”.

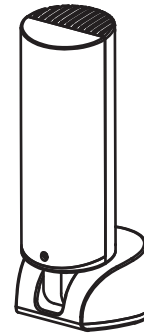
**Figure 6**



### 1.3.5 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.

**Figure 7**



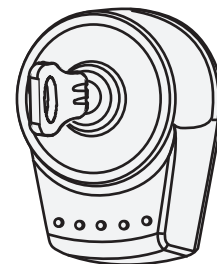
**Table 2: List of small parts for PF-1**

	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs

### 1.3.6 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

**Figure 8**



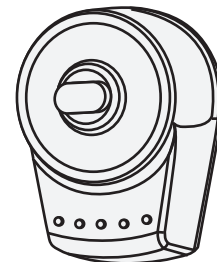
**Table 3: List of small parts for PKS-1**

	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs
Keys	2 pcs

### 1.3.7 PPB-1 Push Button

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

**Figure 9**



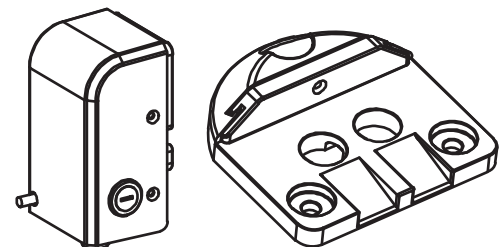
**Table 4: List of small parts for PPB-1**

	Quantity
3*20 Screw	3 pcs
Nylon screw anchor	3 pcs

### 1.3.8 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.

**Figure 10**



**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

## 2) Installation:

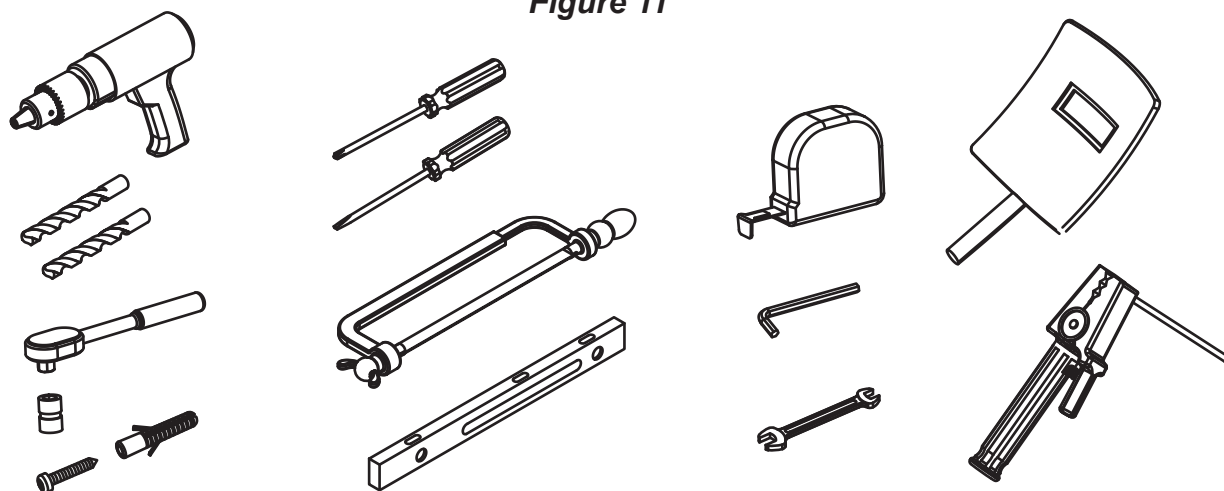
### 2.1 Notes of Motors in Operation

The PW220/PW230 gate openers are applicable to per leaf of 2.5/3.5 meters in width and 200/300 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.

### 2.1.1 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**



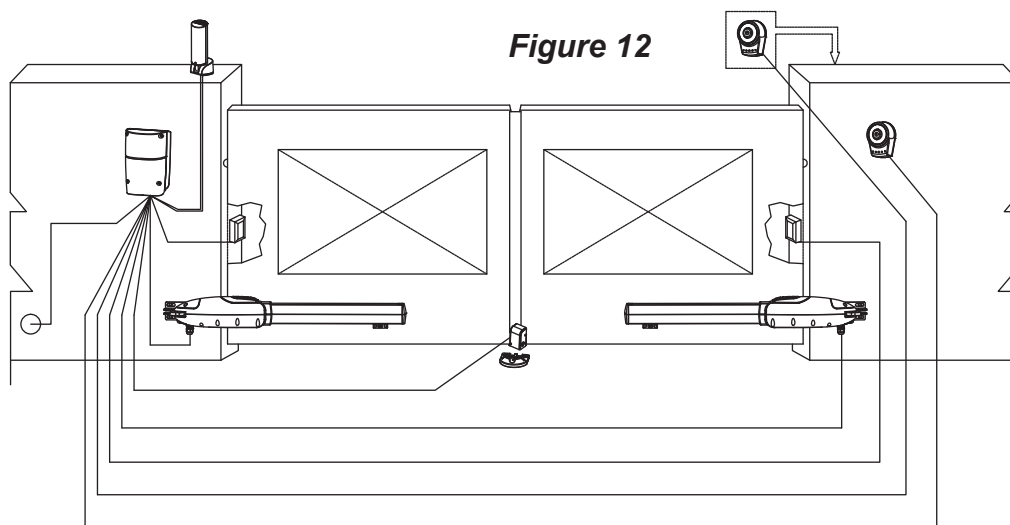
### 2.1.2 Motors, Components and Its Installation in Illustration

The installation procedure of PW220/PW230 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 PW220/PW230.

**Figure 12**



## 2.2 Power Connection

PW220/PW230 is required to connect two cores wires, which 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

### 2.2.1 Notes for Power Connection

1. The installation of power supply cable to the motor should be carried out 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.

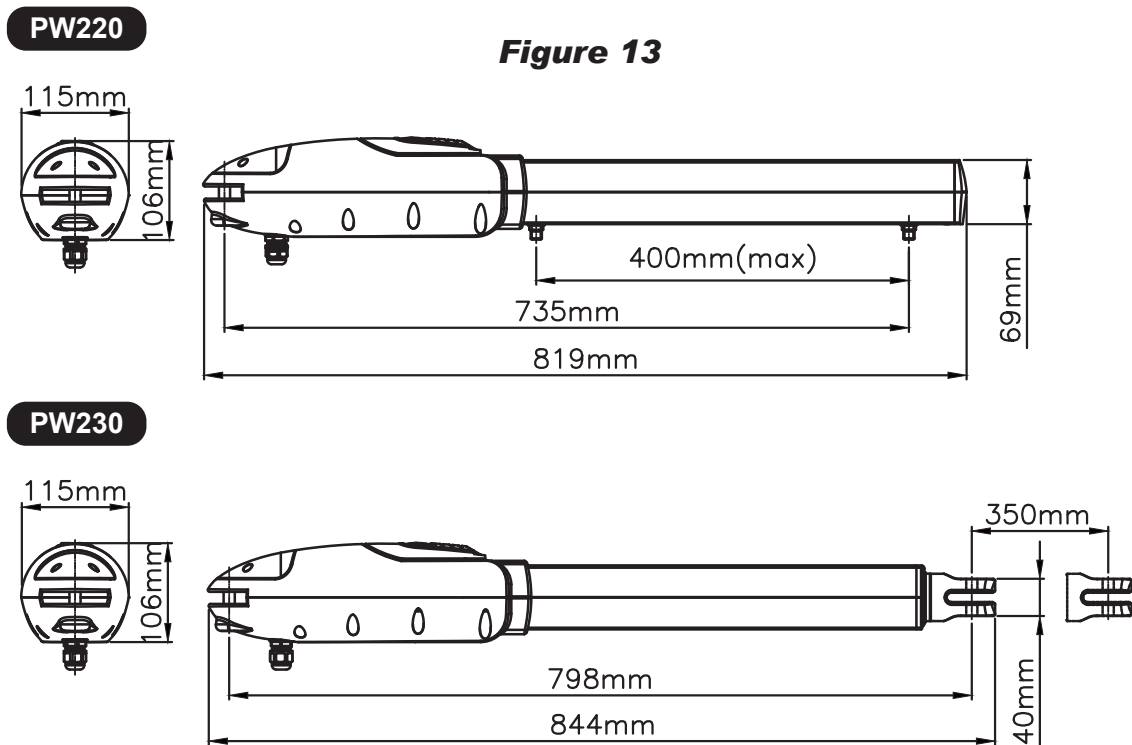
## 2.3 Installation

### 2.3.1 Preparation for Motor Installation

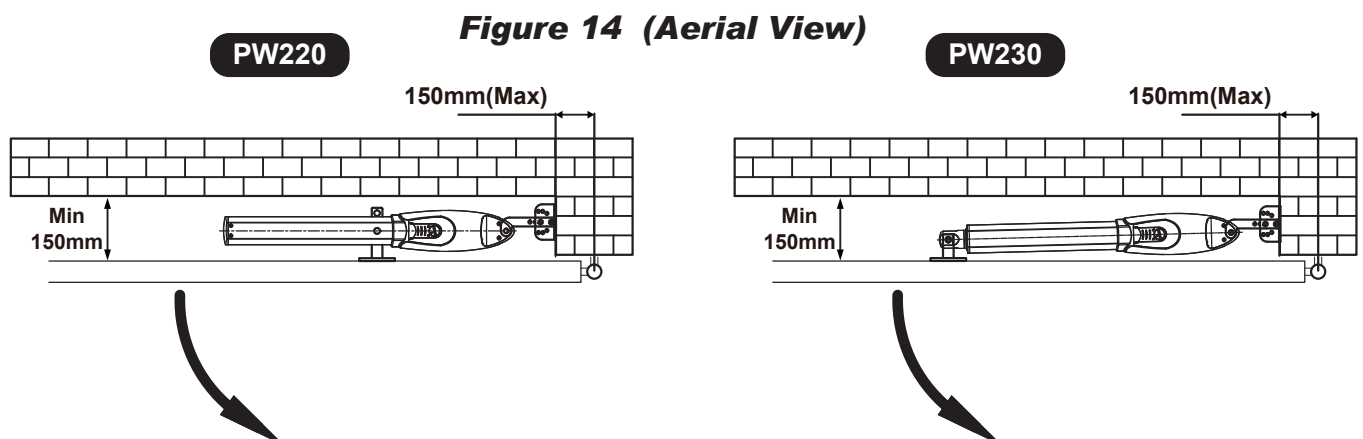
PW220/PW230 is not applicable to a gate which is inefficient or unsafe, neither to solve the defects due to incorrect installation nor poor maintenance.

Check the following items before going for installation:

- 1). Make sure the weight and dimensions of the gate conform to the operation range of PW220/PW230. Don't use PW220/PW230 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.



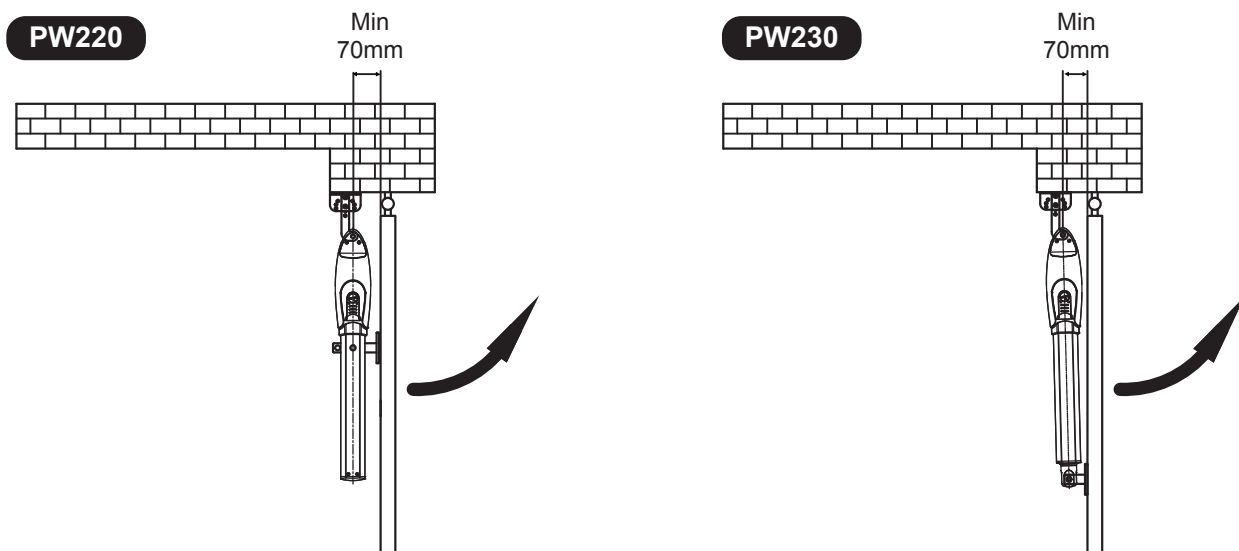
- 8). Make sure to leave enough space when the gate is opening.





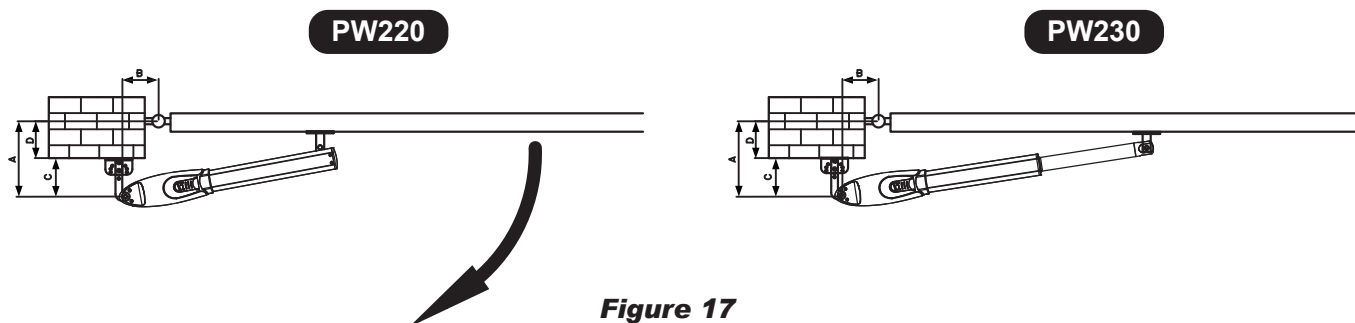
9). If the gate is OPENED OUTWARD, please leave at least 70mm between the post brackets and the gate.

**Figure 15** (Aerial View)

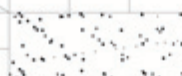

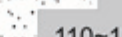




10). Using the leaf-opening angle as criteria to make sure all criteria in **Figure 17** can be met.

**Figure 16** (Aerial View)



**Figure 17**

B(mm)		120	130	140	150	160	170	180	190
A(mm)									
120									
130									
140									
150									
160									
170									
180									
190									

B(mm)	120	130	140	150	160	170	180	190
A(mm)	120	<div>&gt;120°</div>						
130								
140								
150								
160					<div>110~120°</div>		<div>100~110°</div>	
170								
180								
190							<div>90~100°</div>	

11). "C" value is 139mm.

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

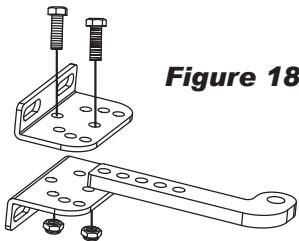
13). "A" = "C" + "D"

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.

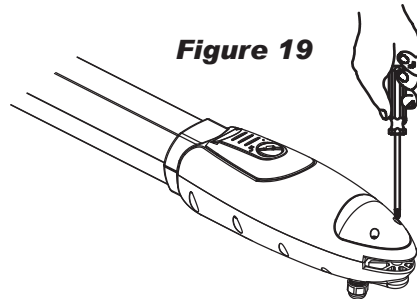
**\*\*Please make sure "B" and "A" are similar or the same in value that the leaves can be operated smoothly, also to reduce the burden of the motor.**

## 2.3.2 Installation of The Gear Motors

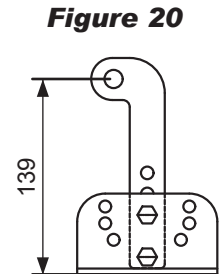
1. Choose the correct dimensions of the motors and position to be installed.
2. Check if the mounting surface the brackets to be installed is smooth, vertical and rigid.
3. Arrange the cable conduit for power supply cable of the motors.
4. In order to obtain the optimal supporting from the rear plate, please assemble two post brackets and one rear metal plate according to **Figure 18**.
5. Loosen the two screws and remove the back cover of the motor as shown in **Figure 19**.
6. Place the leaves in the closed position.



**Figure 18**

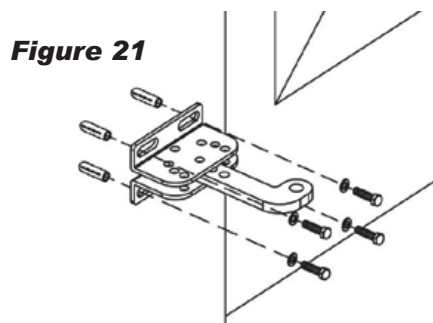


**Figure 19**

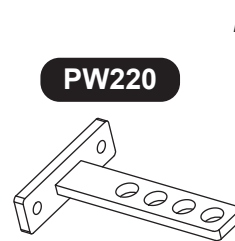


**Figure 20**

7. 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 23** i.e. the position the front plate of the motor to be installed.
8. 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.
9. Please make sure the front plate is completely installed horizontally.



**Figure 21**

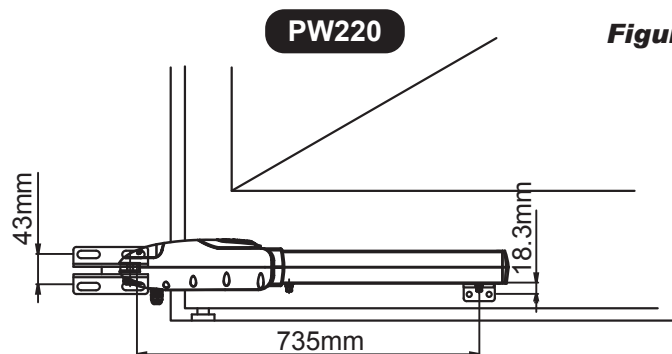


**PW220**



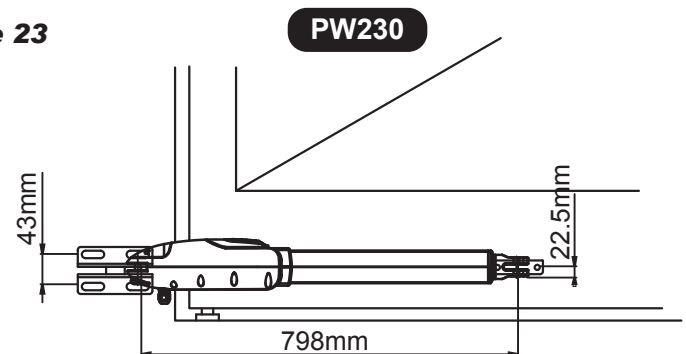
**PW230**

10. Refer to **Figure 23**, the distance between front plate of the motor and rear plate is 735mm (PW220) / 798mm (PW230), the difference in height is 18.3mm (PW220) / 22.5mm (PW230).



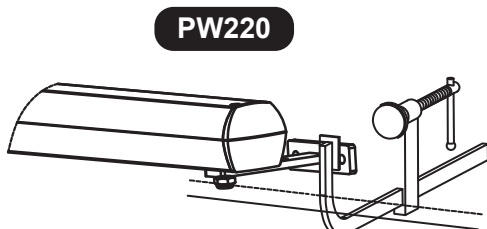
**PW220**

**Figure 23**



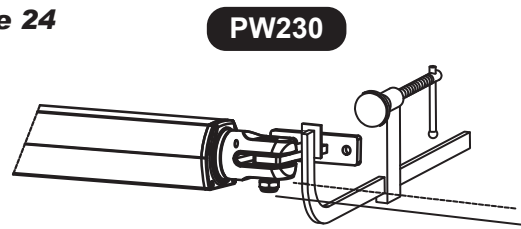
**PW230**

11. Clamp and fix the motor front plate on the door temporarily.



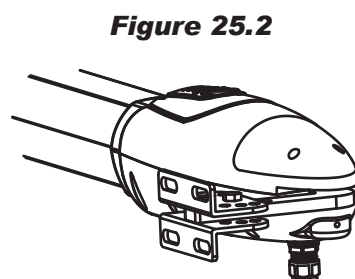
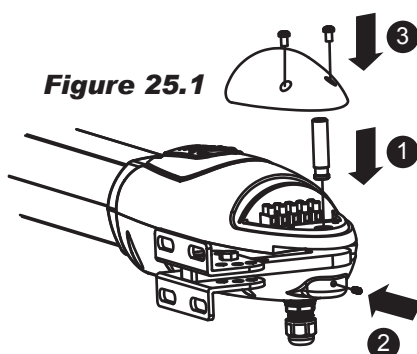
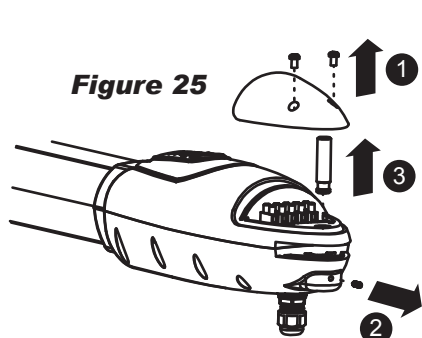
**PW220**

**Figure 24**



**PW230**

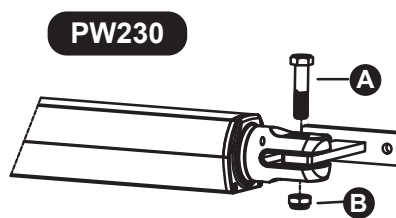
12. Lift up the motor and insert the screws into the front plate.
13. Open the gear motor cover and release the screw, then take out the bolt as below **Figure 25**. Lift the motor overhead and push the gate to the end until the screw holes of the motor end matches the holes on the rear plate as shown in **Figure 25.1** and fasten the motor to the rear plate with bolt and screw as shown in **Figure 25.2**.



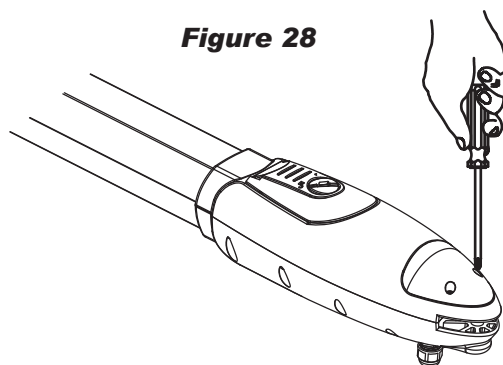
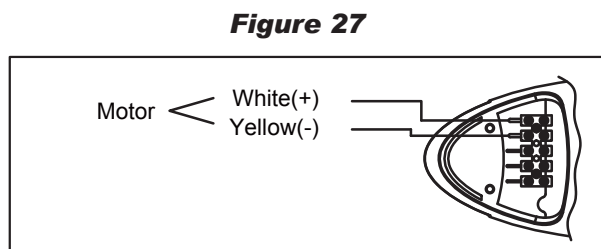
14. Fasten the nut tightly and loosen it for half round for motor supporting in rotating.
15. Fasten the motor front end to the front plate with the bolt (A) and nut (B) tightly. Fully tighten the screw.



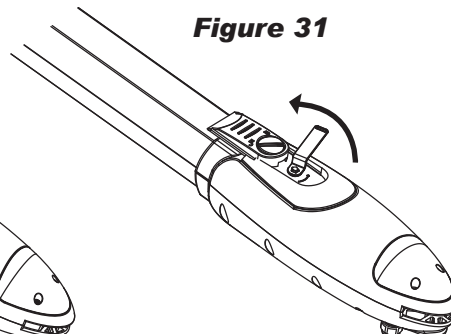
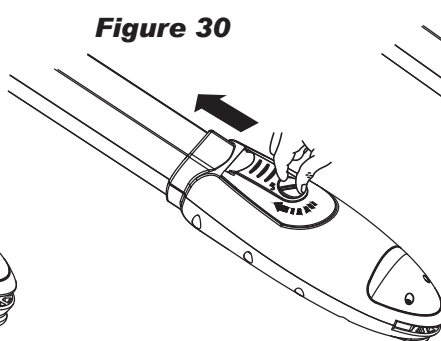
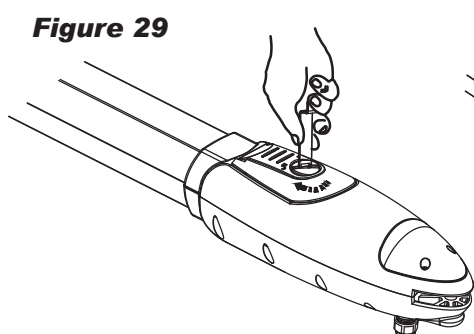
**Figure 26**



21. Connect the motor power cable as shown in **Figure 27**.
22. Close the gear motor cover by tightening the two screws as shown in **Figure 28**.



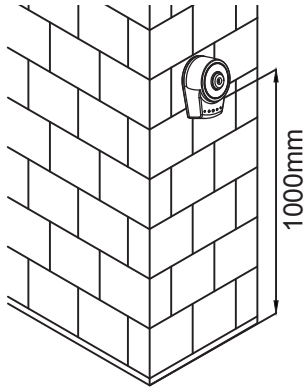
23. Gear Motor Release
  - 1) Turn the round plate on the release part to "OPEN" position. See **Figure 29**.
  - 2) Push out the release part to the end. See **Figure 30**.
  - 3) Use the release key to turn the pin anti-clockwise to the end. See **Figure 31**.



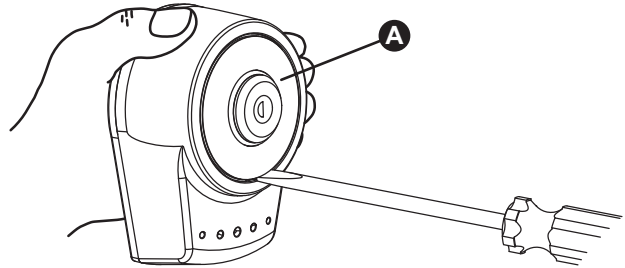
### 2.3.3 PKS-1 Key Selector

- 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 2.3.3 (1)**.
- 2). Remove the round cover (A) by prizing it out with a screwdriver. See **Figure 2.3.3 (2)**.
- 3). Unscrew the two screws beside the lock body. See **Figure 2.3.3 (3)**.
- 4). Turn the key and separate the bottom of the shell with the lock body. See **Figure 2.3.3 (4)**.

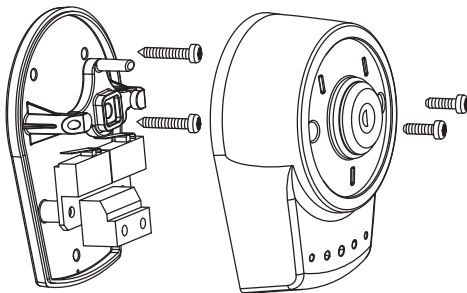
**Figure 2.3.3 (1)**



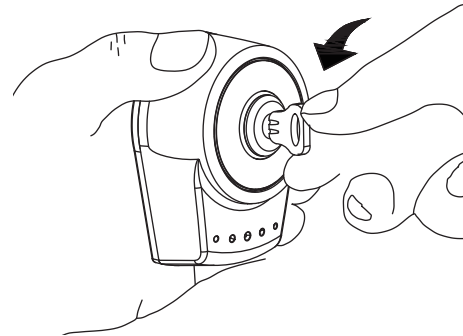
**Figure 2.3.3 (2)**



**Figure 2.3.3 (3)**

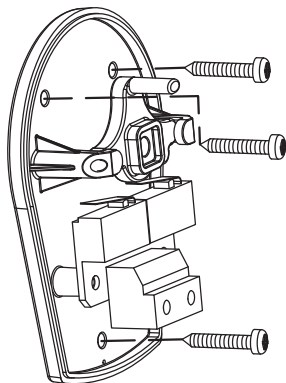


**Figure 2.3.3 (4)**

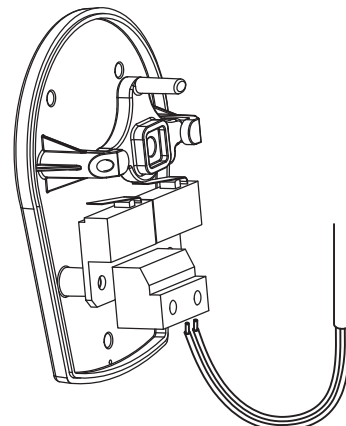


- 5). Bore the three holes at the bottom and mark the points by the holes as reference.
- 6). Drill the holes in the wall and fix the bottom to the wall by three screws. See **Figure 2.3.3 (5)**.
- 7). Connect the electric wires to the terminals as shown in **Figure 2.3.3(6)**, and it's not required 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 2.3.3 (5)**



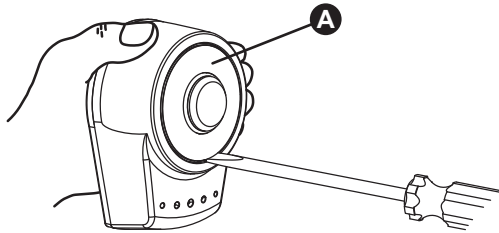
**Figure 2.3.3 (6)**



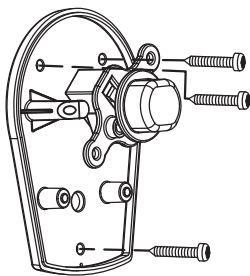
### 2.3.4 PPB-1 Push Button

- 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 2.3.4 (1)**.
- 3). Unscrew the two screws beside the button.
- 4). Separate the upper shell with the bottom. See **Figure 2.3.4 (2)**.
- 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 2.3.4 (3)**.
- 7). Connect the electric wires to the terminals as shown in **Figure 2.3.4 (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.

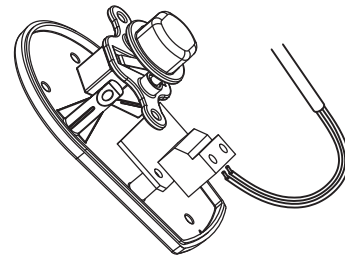
**Figure 2.3.4 (1)**



**Figure 2.3.4 (3)**



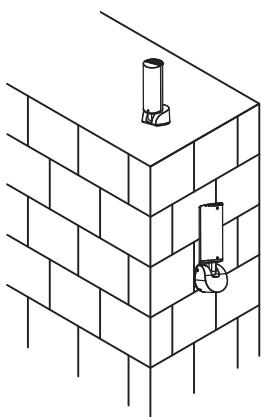
**Figure 2.3.4 (4)**



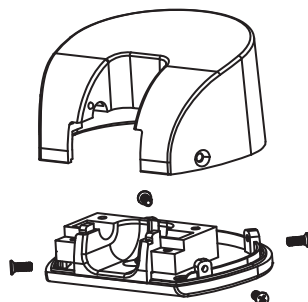
### 2.3.5 PF-1 Flashing Light

- 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 2.3.5 (1)**.
- 2). Unscrew the four screws on the light base and separate the base with the bottom as shown in **Figure 2.3.5 (2)**.
- 3). Connect the wires and penetrate the wires into the hole of the base. See **Figure 2.3.5 (3)**.
- 4). Drill the holes in the wall and fix the bottom to the wall by three screws. See **Figure 2.3.5 (4)**.

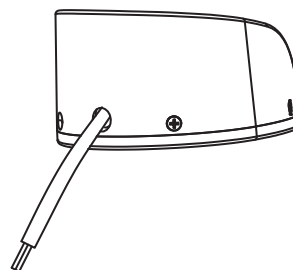
**Figure 2.3.5 (1)**



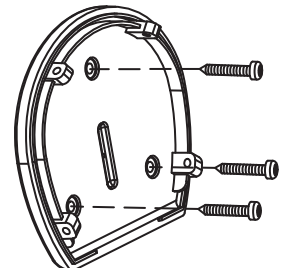
**Figure 2.3.5 (2)**



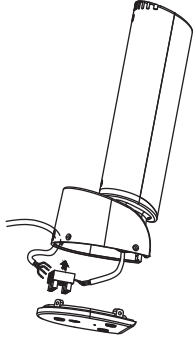
**Figure 2.3.5 (3)**



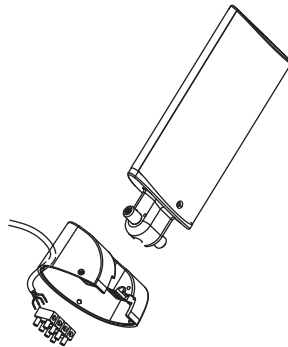
**Figure 2.3.5 (4)**



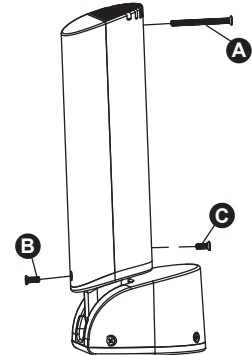
- 5). Connect the four wires of the light and the antenna to the PCB terminals and place the wires into the conduit if necessary. See **Figure 2.3.5 (5)**.
- 6). Tighten the four screws back on the light base. **Figure 2.3.5 (6)**
- 7). Replacing the bulb set. See **Figure 2.3.5 (7)**
  - 7.1) Unscrew 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 2.3.5 (5)**



**Figure 2.3.5 (6)**

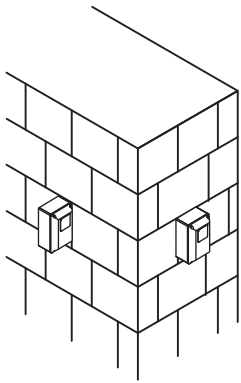


**Figure 2.3.5 (7)**

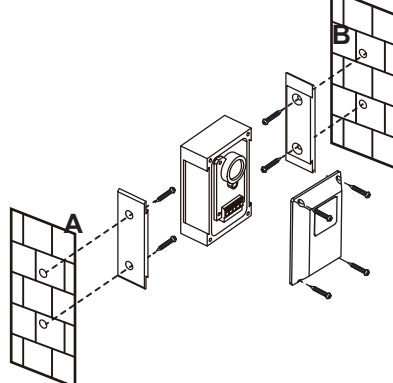
## 2.3.6 PH-1 Photocells

- 1). Decide the installation position of the photocells. See **Figure 2.3.6 (1)**.
- 2). Unscrew the screws and secure the photocells on the post A, B or C. See **Figure 2.3.6 (2)** and **(3)**.

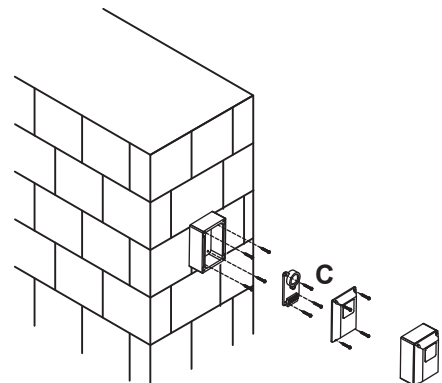
**Figure 2.3.6 (1)**



**Figure 2.3.6 (2)**



**Figure 2.3.6 (3)**



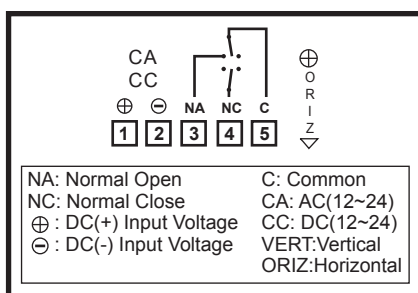
- 3). Wiring connection:

TX: Connect terminals 1 and 2 on the transmitter with the terminals GND and 24V on the PC160 PCB.

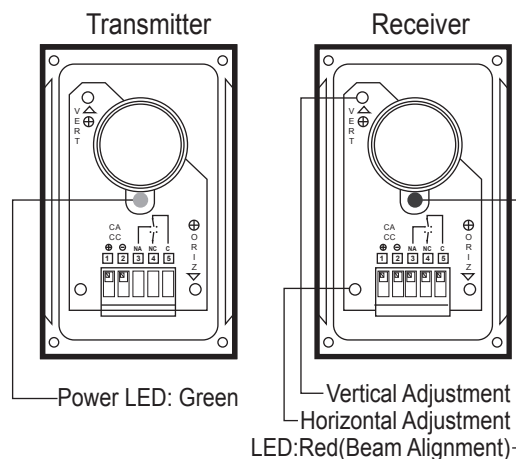
RX: Connect terminals 1, 2 and 4 on the receiver with the terminals GND, 24V and phot1 on the PC160 PCB. And use an extra wire to connect terminals 2 and 5 on the receiver as a bridge.

See **Figure 2.3.6 (4)** **Figure 2.3.6 (5)** and **Figure 2.3.8 (5)**

**Figure 2.3.6 (4)**



**Figure 2.3.6 (5)**





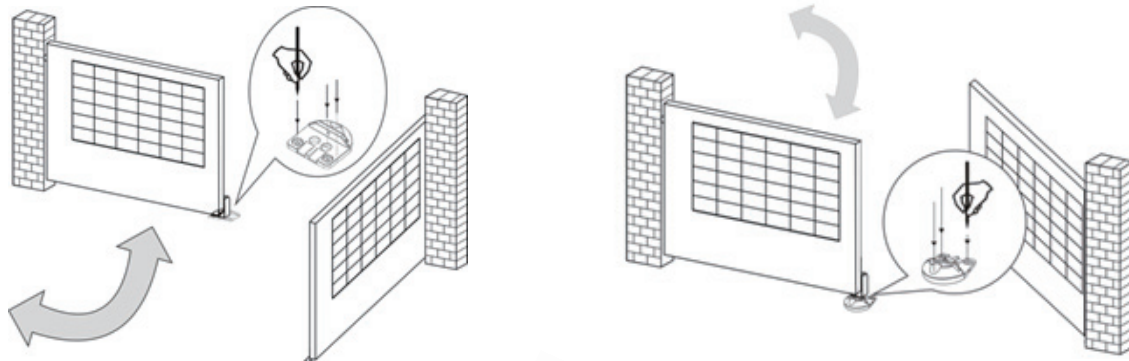
## 2.3.7 PEL-1 Electric Latch and PS-1 Stopper

### 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 2.3.7 (1)** For the gate opened inward.

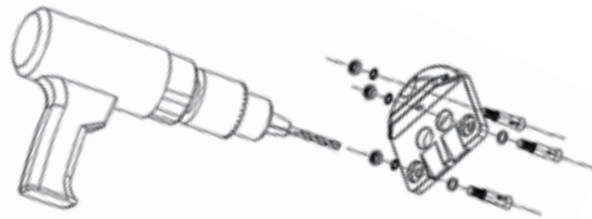
See **Figure 2.3.7 (2)** For the gate opened outward.



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 2.3.7 (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.

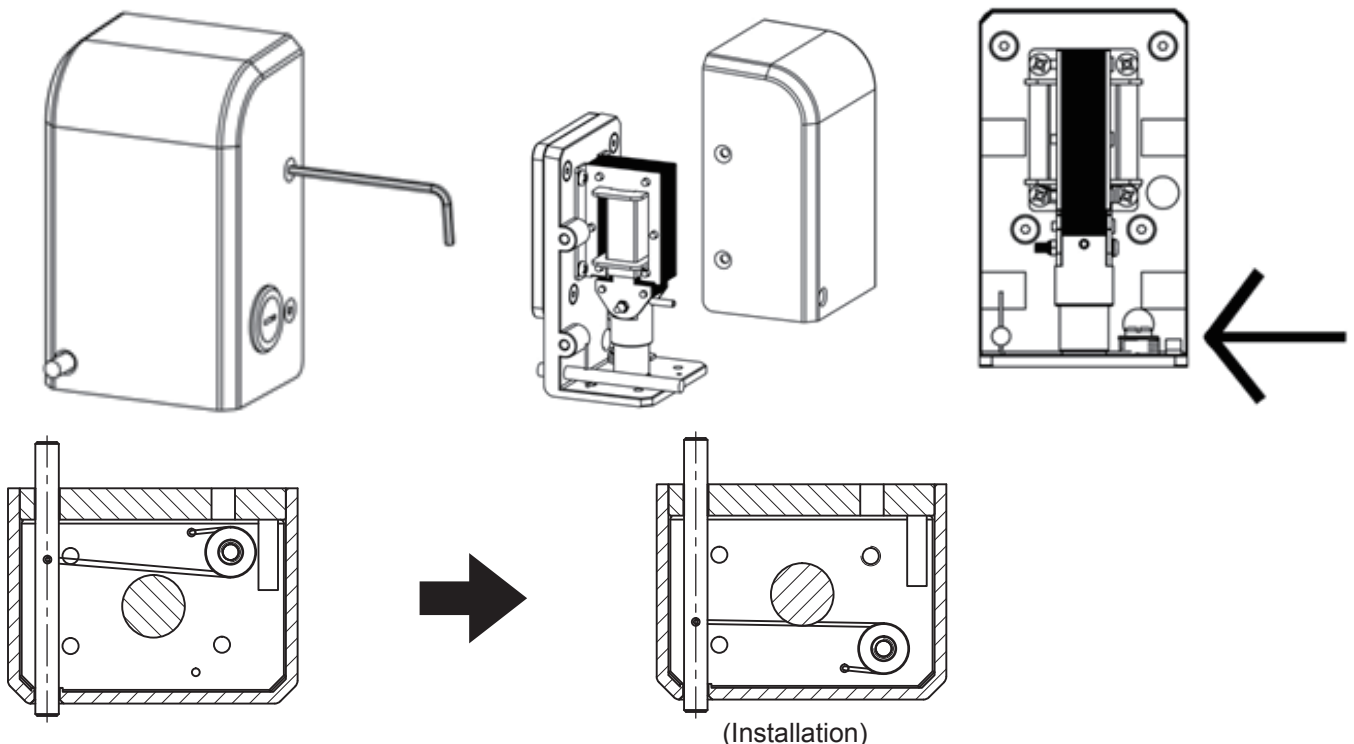
See **Figure 2.3.7 (4)**, **Figure 2.3.7 (5)**, **Figure 2.3.7 (6)** & **Figure 2.3.7 (7)**

**Figure2.3.7(4)** Unscrew the screws.

**Figure2.3.7(5)** Take the casing off.

**Figure2.3.7(6)**

The location of the spring.

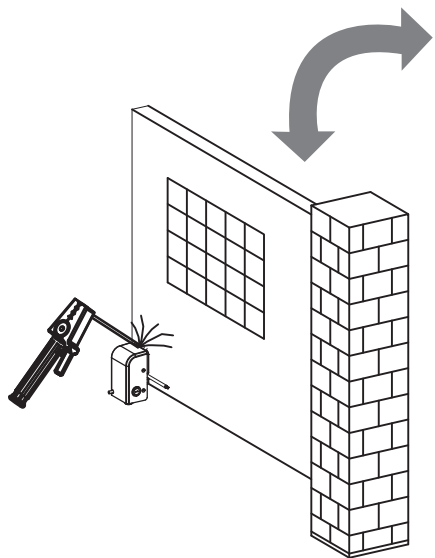


**Figure2.3.7(7)**

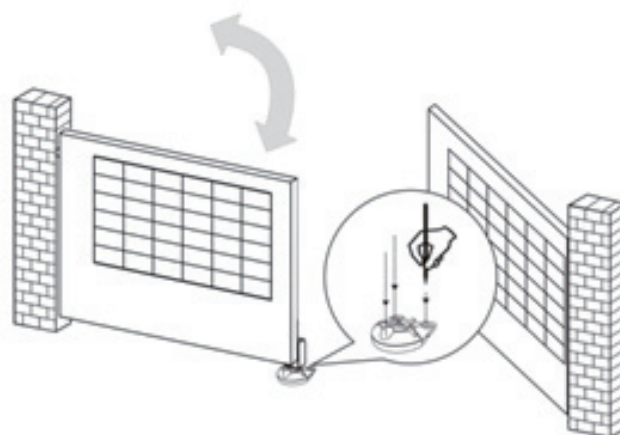
Change the spring and screw it in the different place.

- 2). Weld the back plate of the electric latch to the surface on the master gate. See **Figure 2.3.7 (8)**.  
Please avoid melting the wires by the heat of the fixed plate.

**Figure2.3.7(8)** For the gate opened inward.

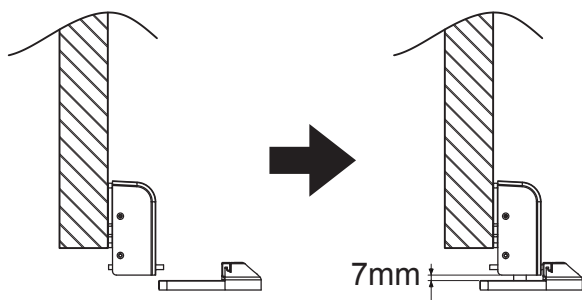


**Figure2.3.7(9)** For the gate opened Outward.

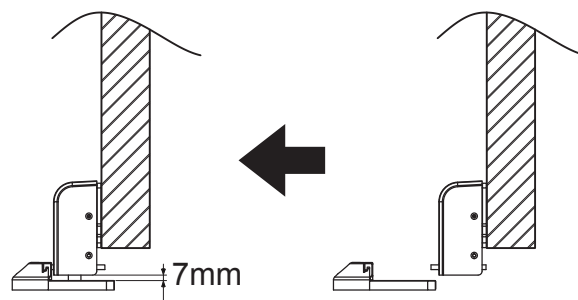


- 3). The gap between the bottom of electric latch and the stopper should be less than 7mm. See **Figure 2.3.7 (10)**

**Figure2.3.7(10)** For the gate opened inward.



**Figure2.3.7(11)** For the gate opened Outward.



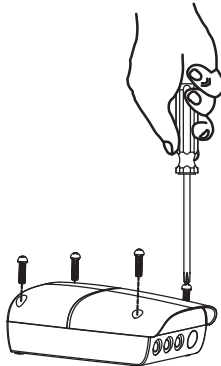
- 4). Connect the wires of the electric latch to the terminal LAT(+) and LAT(-) on the PCB.



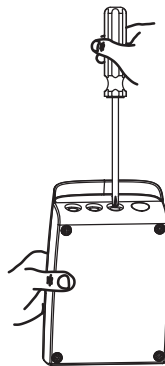
## 2.3.8 PC160 Control Box

1. Decide the installation position of PC160 control box first, it is suggested to be installed near the gate and should be protected from possible damage. Be aware of the motor cable length before deciding the installation position.
2. Remove the cover by unscrewing the four screws on the cover. See **Figure 2.3.8 (1)**.
3. Use a screwdriver to puncture the holes beneath the bottom of the control box. See **Figure 2.3.8 (2)**.
4. Secure it on the wall. See **Figure 2.3.8 (3)**.

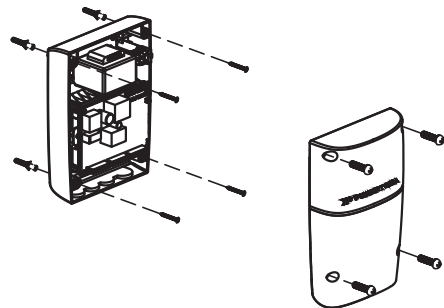
**Figure 2.3.8 (1)**



**Figure 2.3.8 (2)**



**Figure 2.3.8 (3)**



### 5. Wiring Connection:

Prepare all the wires of the accessories beforehand and connect the wires to the gear motors and accessories on the PCB as shown in Figure 2.3.8 (4). All of the wiring connections of the accessories are not requested to distinguish the positive (+) and the negative (-) polarity.

- 1). **PF-1 Flashing light:** Connect the two wires from the flashing light to the terminal LIT (+) and LIT (-) on the PCB.
- 2). **PEL-1 Electric Latch:** Connect the two wires from the electric latch to the terminal LAT (+) and LAT (-) on the PCB.
- 3). **PW220/PW230 Gear Motors:**

Refer to **Figure 2.3.8 (5)** and connect the wires separately to the terminals on the PCB.

**M1: Connect the motor wire (White +) to the terminals M1 (+), and (Yellow -) to the M1 (-).**

**M2: Connect the motor wire (White +) to the terminals M2 (+), and (Yellow -) to the M2 (-).**

#### Notes:

For gates opened outward,

**M1: Connect the motor wire (Yellow -) to the terminals M1 (+), and (White +) to the terminals M1 (-).**

**M2: Connect the motor wire (Yellow -) to the terminals M2 (+), and (White +) to the terminals M2 (-).**

#### 4). PH-1 Photocells:

Please remove the cover of JP1 and connect the wires to proper terminals.

#### 5). PKS-1 Key Selector:

For Single leaf operation-

Refer to Figure 2.3.8 (4) and connect the two wires from the key selector to the terminal BUTT1 and GND (J7) on the PCB.

For Dual leaf operation-

Refer to Figure 2.3.8 (4) and connect the two wires from the key selector to the terminal BUTT2 and GND (J7) on the PCB.

#### 6). PPB-1 Push Button:

For Single leaf operation-

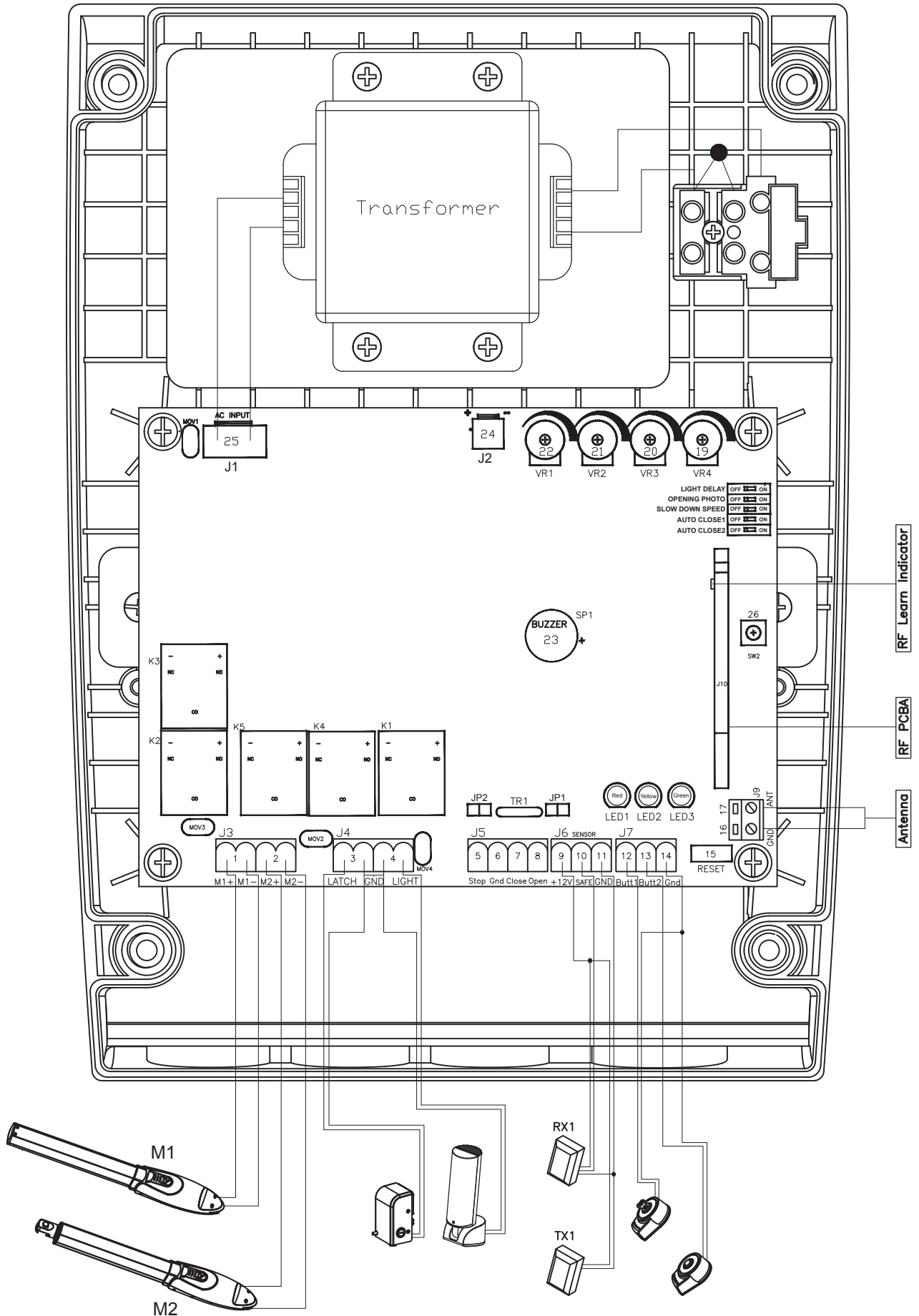
Refer to Figure 2.3.8 (4) and connect the two wires from the key selector to the terminal BUTT1 and GND (J7) on the PCB.

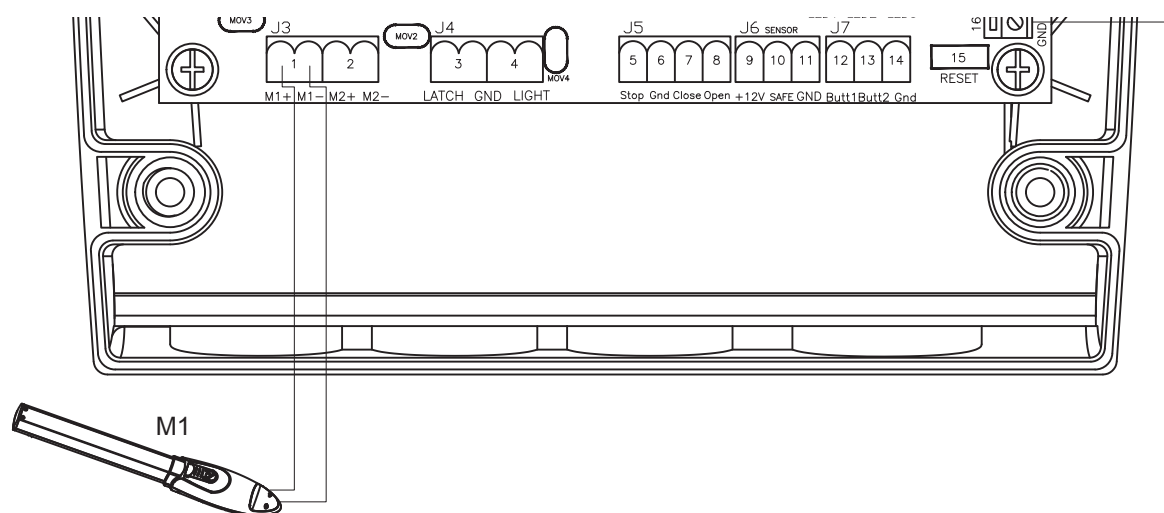
For Dual leaf operation-

Refer to Figure 2.3.8 (4) and connect the two wires from the key selector to the terminal BUTT2 and GND (J7) on the PCB.

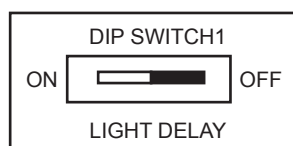
- 7). **JP2 Jumper Socket:** If there is any external device connecting to stop/GND/close/open terminals on the PCBA, please remove JP2 cover to make the device effective.

**Figure 2.3.8(4)**





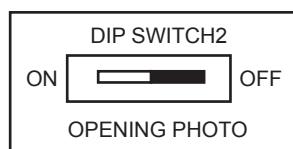
### 3). Dip Switch Setting



#### **LIGHT DELAY: (Factory Default: OFF)**

**ON:** The flashing light blinks for 5 seconds before the gate moves.

**OFF:** The flashing light blinks and the gate moves simultaneously.



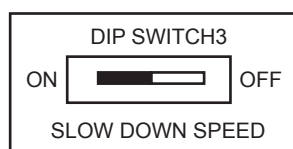
#### **OPENING PHOTO: (Factory Default: OFF)**

**ON:** In the opening phase, the gate will stop when the photo sensor is activated.

In the closing phase, the gate will stop and open to the end when the photo sensor is activated.

**OFF:** In the opening phase, the gate will not stop when the photo sensor is activated.

In the closing phase, the gate will stop and open to the end when the photo sensor is activated.

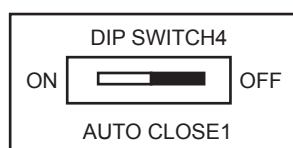


#### **SLOW DOWN SPEED: (Factory Default: ON)**

The final speed can be set when the gate is moving at slow-down speed.

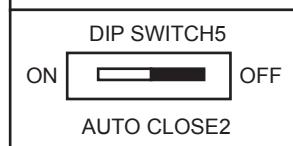
**ON:** The final speed = 55% normal speed.

**OFF:** The final speed = 70% normal speed.



#### **AUTO CLOSE1: (Factory Default: OFF)**

The function of auto close or without auto close can be selected.



#### **AUTO CLOSE2: (Factory Default: OFF)**

The function of auto close or without auto close can be selected.

DIP4 (Auto close1)	DIP5 (Auto close2)	Function
OFF	OFF	Without auto close function
OFF	ON	Auto close On, waiting time 50 seconds
ON	OFF	Auto close On, waiting time 25 seconds
ON	ON	Auto close On, waiting time 12 seconds

NC: No Connection

### 3.1 Functional Switch and LED lights Introduction

<b>SW2</b>	The button of transmitter memorizing and erasing.
<b>VR1</b>	Close delay of two leaves can be adjusted from min 0 second to Max. 7 second.
<b>VR2</b>	The over-current sensitivity of Slave Gate (M2) could be adjusted from 1.8 second to 3.8 second.
<b>VR3</b>	The over-current sensitivity of Master Gate (M1) could be adjusted from 1.8 second to 3.8 second.
<b>VR4</b>	Over-current limit can be adjusted from min 0.8Amp to Max 4.2 Amp.
<b>LED1 (Red)</b>	LED1 is ON when AC input is in. And LED1 blinks quickly when the gate is in slow-down speed.
<b>LED2 (Yellow)</b>	When the photocells are triggered, LED2 will be on.
<b>LED3 (Green)</b>	When the transmitter/push button/key selector is triggered, LED3 will be on.

Notes:

1. VR1,VR2,VR3 will be adjusted to 10 o'clock direction as the factory default.
2. VR2 will be adjusted to 2 o'clock direction as the factory default.

### 3.2 Transmitter Memorizing and Erasing Process

#### RF Transmitter Memorizing & Erasing

3.2.1 Press button SW2 for 1 second, the blue LED light on the receiver board will be on and receiver module will be changed to "Learning Mode" for 10 seconds. During the period of learning mode, press the left button on the transmitter, then the transmitter can be memorized by receiver module. (Up to 200 different transmitter can be memorized) The blue light on the receiver board will blink twice after pressing the button on the transmitter. The blue light on the receiver board will go off when the transmitter memorizing is done.

3.2.2 The memory can be cleared completely if the SW2 (code learning) is pressed continuously for 10 seconds after the blue light.

#### Self-Learning mode for gate operation systems

<b>Step1:</b>	Connect the wires of two motors with terminal M1+/M1- & M2+/M2-
<b>Step2:</b>	Connect 230VAC with terminal J1 and battery with J2.
<b>Step3:</b>	In single leaf installation, just connect the motor wires with terminal M1+/M1-
<b>Step4:</b>	Press SW2 button for more than 1 second and the blue light on the receiver board is on. Press the left button on the transmitter to memorize the transmitter with the receiver board. The blue light will be off after the transmitter memorizing is done.
<b>Step5:</b>	<p>In Single or Dual leaf installation, please press the left button of the remote control for system learning. After pressing the left button, system learning will be executed step by step as follows:</p> <p><b>1. Dual Gate:</b> Slave Gate Close → Master Gate Close → Master Gate Open → Slave Gate Open → Slave Gate Close → Master Gate Close</p> <p><b>2. Single Mode :</b> Master Gate Close → Master Gate Open → Master Gate Close</p>
<b>Step 6:</b>	If motor stops during the learning mode, please adjust the over current switch to proper position.

### 3.3 System Learning Process

Connect the master motor wires to M1 terminals and the slave motor wires to M2 terminals correctly. If only one gate is installed, the motor wires have to be connected to M1 terminals.

In system learning mode, the gates will proceed with the following procedures.

- (A) Dual-Gate Mode: Slave Gate closes→ Master Gate closes→ Master Gate opens →Slave Gate opens → Slave Gate closes→ Master Gate closes.
- (B) Single-Gate Mode: Master Gate closes→ Master Gate opens→ Master Gate closes.

**Notes:** System learning fails and needs to be learned again when an unpredictable interruption occurs.

### 3.4 Gate Operation

#### 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.



### 3.5 Gate-moving Logic

(A) In gate-opening phase: The gates stop if the transmitter/push button/key selector is activated, and close when the transmitter/push button/key selector is reactivated.

(B) In gate-closing phase: The gates stop if the transmitter/push button/key selector is activated, and open when the transmitter/push button/key selector is reactivated.

(C) In gate-opening or gate-closing phase: For safety purpose, the gates stop if encountering obstacles.

## 4. Trouble Shooting

Symptoms	Recommended checks and possible solution
Overheated Back-up Batteries	Check the wiring connection of the batteries.
The gate doesn't move when pressing the button of the transmitter	<ol style="list-style-type: none"><li>1. Check if the voltage of the batteries is below 21V.</li><li>2. Check if LED1 is "ON".</li><li>3. Make sure all the wiring connections are firmly connected to the terminals on the PCB.</li><li>4. Make sure the fuse is workable.</li></ol>
The Flashing light does not work	<ol style="list-style-type: none"><li>1. Check if the wiring connection of the flashing light is correct.</li><li>2. Check if the bulb is burned.</li></ol>
The leaves shall be closed instead of opening	Change the polarity connection of the positive (+) with the negative (-) of the gear motors.
The leaves does not move or only move toward one direction	<ol style="list-style-type: none"><li>1. Check if the "RESET" socket is activated.</li><li>2. Make sure the wiring connection of the gear motors is firm.</li><li>3. The GND terminal of the photocells on the PCB must be short-circuited if no photocells installed.</li></ol>
The master gate closes to the end first and the slave gate stops, the flashing light blinks fast for five seconds.	Cut off the AC input power and the output of the batteries. Release the master gate and slave gate manually, then open the master to the end and close the slave gate to the end by hand, then power the whole unit by connecting the AC and battery terminals.
The gear motors does not run and the relay is noisy when operating the gate opening and closing.	Check if the fuse is burned.

## 5. Technical Characteristics

### 5.1/5.2 PW220 / PW230

	PW220	PW230
<b>Motor</b>	24Vdc motor with mechanical release	24Vdc motor with mechanical release
<b>Gear type</b>	Worm gear	Worm gear
<b>Peak thrust</b>	2500N	3000N
<b>Nominal thrust</b>	2000N	2500N
<b>Stroke length</b>	356mm with mechanical stop/400mm without mechanical stop.	350mm
<b>Power supply</b>	24Vdc	24Vdc
<b>Maximum operating current</b>	4A for maximum 10 seconds.	4A for maximum 10 seconds.
<b>Maximum gate weight</b>	200 kg per leaf	300 kg per leaf
<b>Maximum gate length</b>	2.5 meters	3 meters
<b>Duty cycle</b>	20%	20%
<b>Operating Temperature</b>	-20°C~+50°C	-20°C~+50°C
<b>Dimension</b>	819mm * 115mm * 106mm	844mm * 115mm * 106mm
<b>Weight</b>	6.0kg	6.25kg

### 5.3 PC160 Control Box

<b>Application</b>	For PW220/PW230 power supply
<b>Main power supply</b>	230Vac/110Vac, 50Hz/60Hz
<b>Back-up battery</b>	2pcs of batteries for emergency operation, 1.2A each
<b>Transformer</b>	4.2A, 24V
<b>Receiver board</b>	433.92MHz; 200 transmitters memory
<b>Installation</b>	Wall mounted vertically
<b>Operating Temperature</b>	-20°C~+50°C
<b>Dimension</b>	275mm * 195mm * 102mm

### 5.4 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

### 5.5 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

### 5.6 PPB-1 Push Button

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

### 5.7 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

### 5.8 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

### 5.9 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