



Electromechanical Speed Bump Type
Tyre Killer
Instruction Manual

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Introduction





The purpose of this section is to ensure that users can use the product correctly through this manual to avoid danger or property loss in operation. Before using this product, please read the product manual carefully and keep it properly for future reference.

Overview

This manual is suitable for Speed Bump Type Tyre Killer. According to this document, we can understand the product structure, parameters, performance and maintenance.

Symbolic convention

For symbols that appear in the document, the following instructions are given:

Symbol	Note
 Illustration	Description of the text, indicating the supplement and interpretation of the text.
 Attention	Note the text to remind users of important operations or to guard against potential damage and property damage.
 Warning	Warning type text indicating potential risk, if not avoided, may cause injury, equipment damage or business interruption.
 Danger	Dangerous text, indicating a high potential risk, if not avoided, may cause a significant risk of casualties.

Safety precautions



Warning

- Equipment installation and use process, must strictly abide by the national and use of electrical safety regulations.
- In wiring, disassembly and other operations, please be sure to disconnect the equipment power supply, do not live operation.
- If the equipment has smoke, odour, or noise, please turn off the power immediately and unplug the power cord, contact the dealer or service center in time.
- If the equipment is not working properly, please contact the shop that buys the equipment or the nearest service center, do not disassemble or modify the equipment in any way. (We are not liable for any problems caused by unapproved modifications or repairs).



Attention

- Please do not use equipment in high temperature, low temperature or high humidity environment, specific temperature and humidity requirements refer to the hydraulic station parameter table.
- Equipment should be stored in dry non-corrosive gas environment to avoid direct sunlight.
- Please keep all the original packaging materials of the Tyre Killer properly so that when there is a problem, use the packaging material to package the Tyre Killer or accessories and send them to the agent or return to the manufacturer for handling. The Company shall not be liable for any accidental damage in transit caused by non-original packaging materials.



Illustration

- Quality requirements for installation and maintenance personnel
Have qualification certificate or experience in installation and maintenance of Tyre Killer system, and must also have the following knowledge and operation skills.
 - Basic knowledge and installation skills of Tyre Killers and components.
 - Basic knowledge and operation skills in wiring and electronic wiring.
 - Basic network security knowledge and skills, and can read the contents of this manual.

1 Overview

1.1 Product Description

The Speed Bump Type Tyre Killer is a new product developed in view of the phenomenon of passing vehicles running through the post at the highway toll station. The main structure is composed of anti-slip pattern plate and adopts electromechanical integrated control device. It has two functions: deceleration and tire binding. It is an essential special facility to control the deceleration of vehicles and prevent vehicles from entering the post savagely. Ensure the personal safety of road and security personnel and national property safety.

Our company developed a new Speed Bump Type Tyre Killer, using modular design, can be flexibly assembled according to the requirements of use, a unit module length of 1 meter. Speed Bump height 68 mm, improve vehicle pass, avoid scratching the chassis of the vehicle. The tyre killer panel is a non-slip pattern board, increasing the friction of the vehicle and passing through 80 tons of trucks. Detachable design of Tyre Killer panel, convenient for later maintenance equipment and cleaning foreign bodies.

1.2 Product characteristics

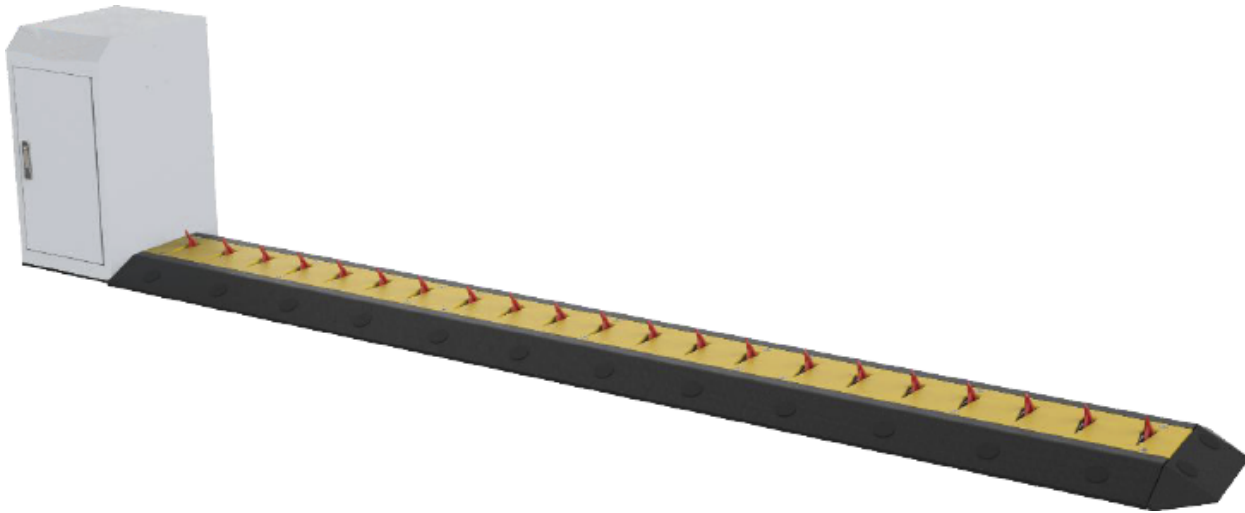
- Mechanical and electrical drive to avoid possible hydraulic oil leakage
- Modular assembly, 1 meter for a unit, flexible assembly
- The rotating shaft between the modules is connected by an adaptive coupling to reduce the friction resistance under the condition of uneven road surface.
- Speed Bump height as low as 68 mm, improve vehicle comfort.
- With power failure and other emergency cases, manual lifting Tyre Killer, manual interception and release function.
- Strong compressing capacity, can withstand static pressure load 100 T, through load 200 T.
- The panel adopts anti-slip pattern plate to improve wear resistance and prevent vehicle from skidding when passing through.
- Top panel removable for easy maintenance and cleaning of foreign matters.
- Angle of raised spikes adjustable, range 60~90 degrees.

2 Main technical parameters

Model	OT-PPOLL
Product Profile Size	(interception width +490 mm)×500 mm× Speed Bump 68 mm (control box 708mm) L×W×H Length 1m: L 1490×W 50×H 68mm (for other lengths add 1mt-modules) Annex E.G: length 6m: 6490mm)
Net weight of equipment	The driving unit 170 kg, 1 m standard assembly unit 84 kg
Interception length	1 m~8 m 1 m per module
Device Width	500mm
Height of Spikes	5 mm
Thickness of Spikes	10mm
Spacing of Spikes	140mm
Top Plate Thickness	10 mm (Q235 non-slip pattern plate)
Compressing Strength	Static pressure 100 T through load 200 T
Surface Finish	Spray Tyre Killers yellow and black spikes red Powder Coated
Control box Dimension	L 456×W 360×H 708mm
Movement Principle	Electrical machinery
Lifting Time	2s
Power Supply	AC 220V 50HZ
Rated Power	260W
Emergency Manual Operation	Manually operate up/down
Operating Temperature	-35℃~+85℃
Operating Humidity	≤90%
Warning mode	Traffic lights (optional)
Remote Control Distance	≥30m
Number of bolts	8 PCS M16 expansion bolts/meter (2 end)

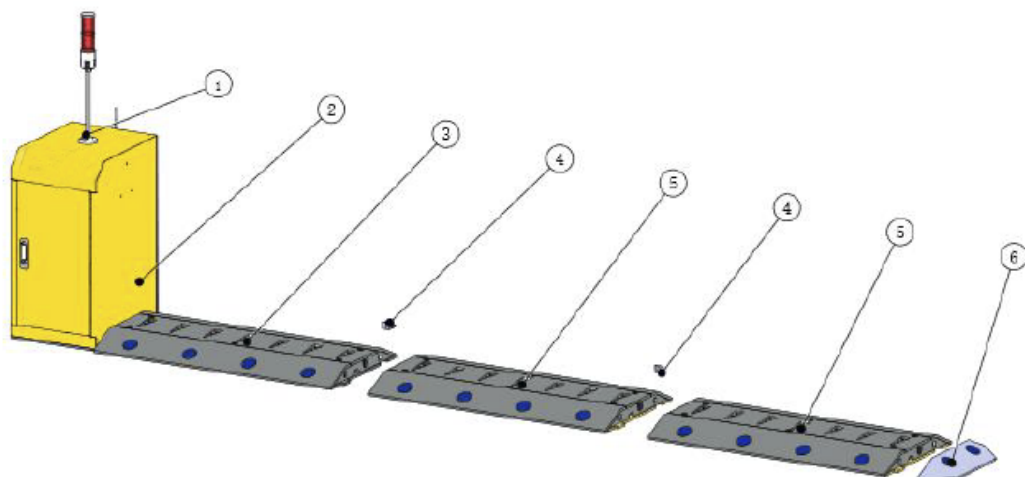
3 Structural Features and Working Principle

3.1 Appearance and Dimensions of Tyre Killer



Product appearance

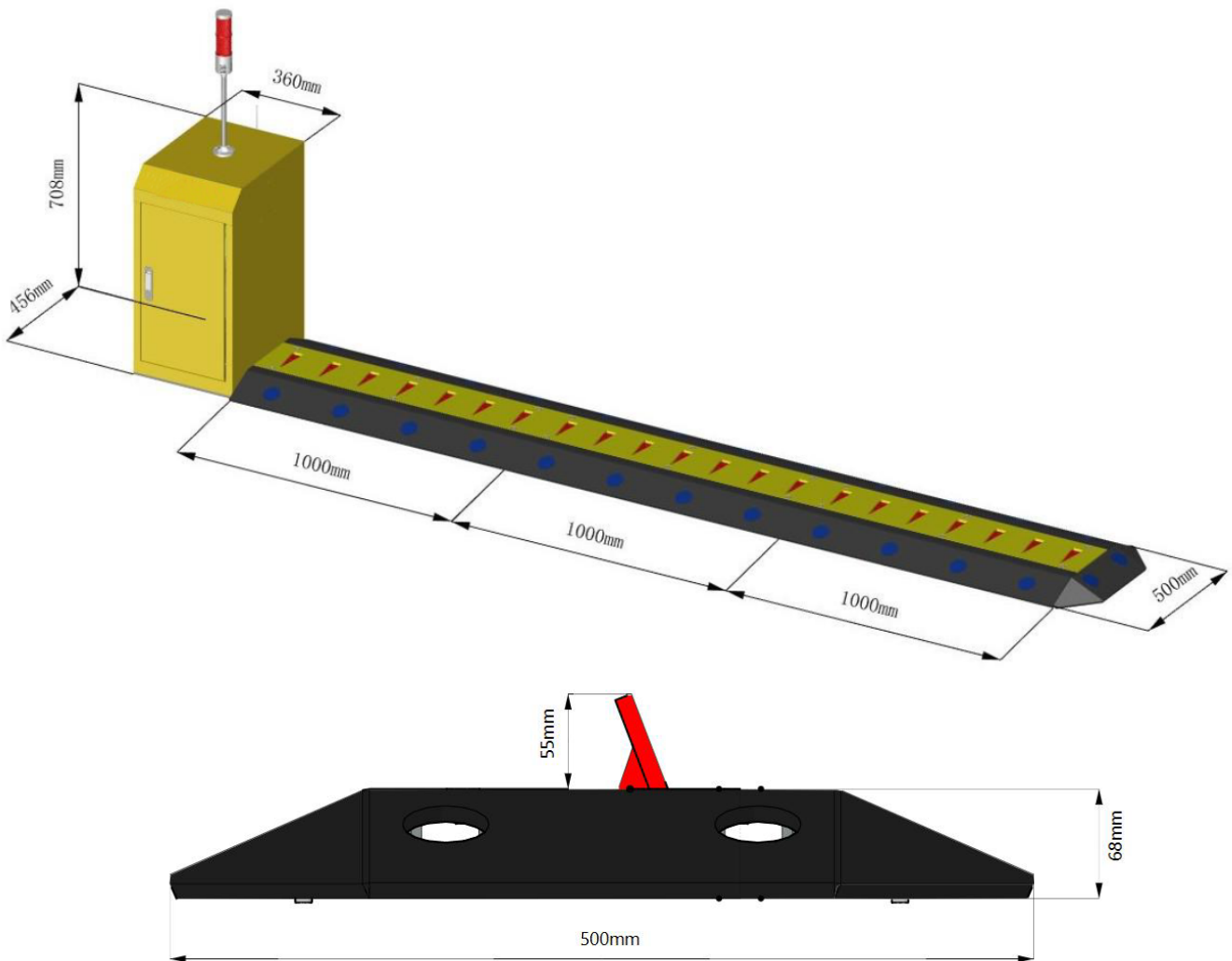
3.2 Main components of Tyre Killer



Main components

Serial	Name of component	Quantity
1	Traffic light (optional)	1
2	Control box	1
3	Drive unit	1
4	Coupling	2
5	1 m modular unit	2
6	End plug	1

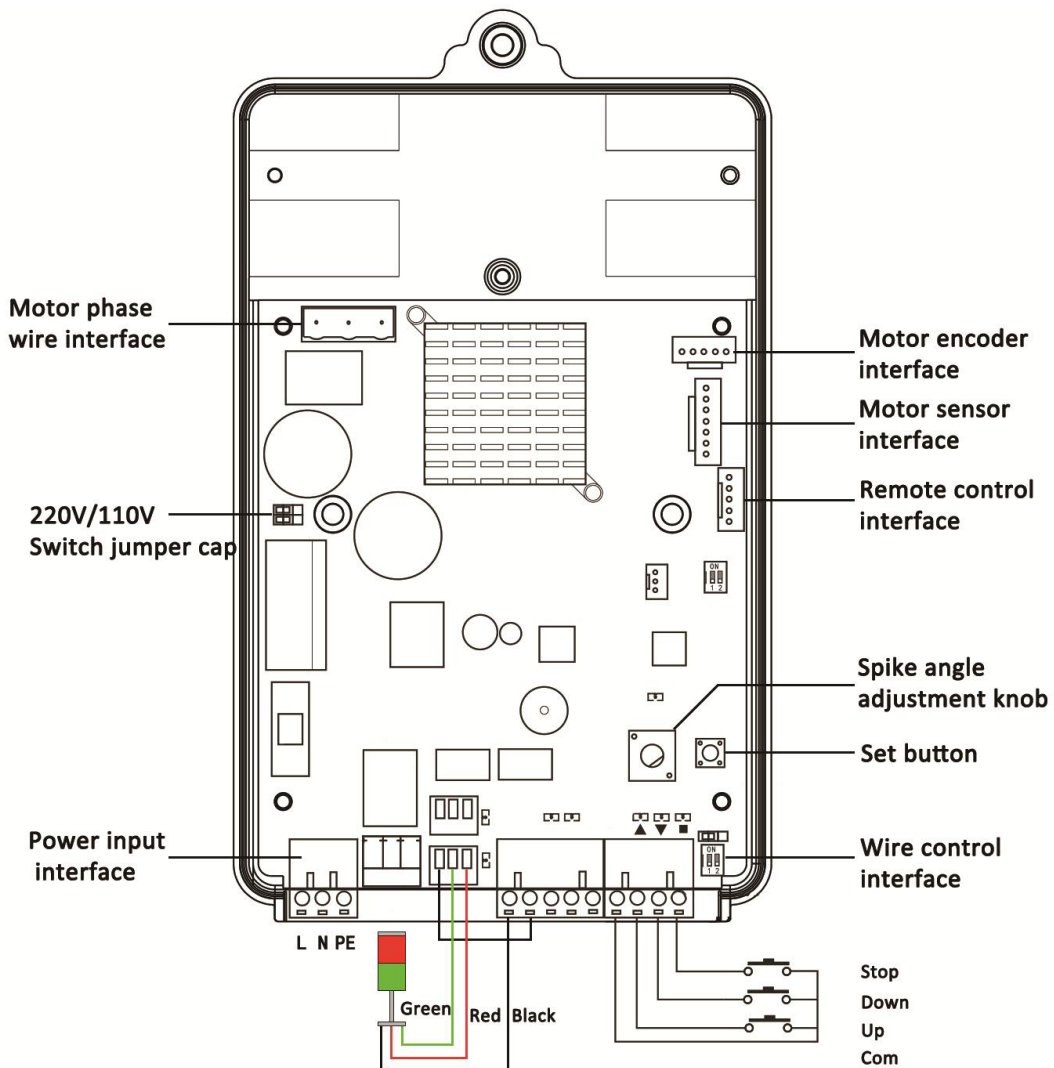
Take 3m electromechanical Tyre Killer as an example.



3.3 Working principle

The Speed Bump Tyre Killer is composed of motor drive structure, high strength pressure speed bump, rotary spindle and broken tire spikes. According to the situation of vehicle entry and exit, when operating, press the remote control lift button, motor operation, through sprocket drive Tyre Killer spindle rotation, so as to drive the spikes on the spindle rise, can achieve automatic lifting of the Tyre Killer, to fulfill the purpose of intercepting a vehicle.

3.4 Electrical wiring of controller



4 Installation and adjustment

4.1 Site survey

Observe and record the surrounding environment according to the customer's designated installation position, with emphasis on the following points

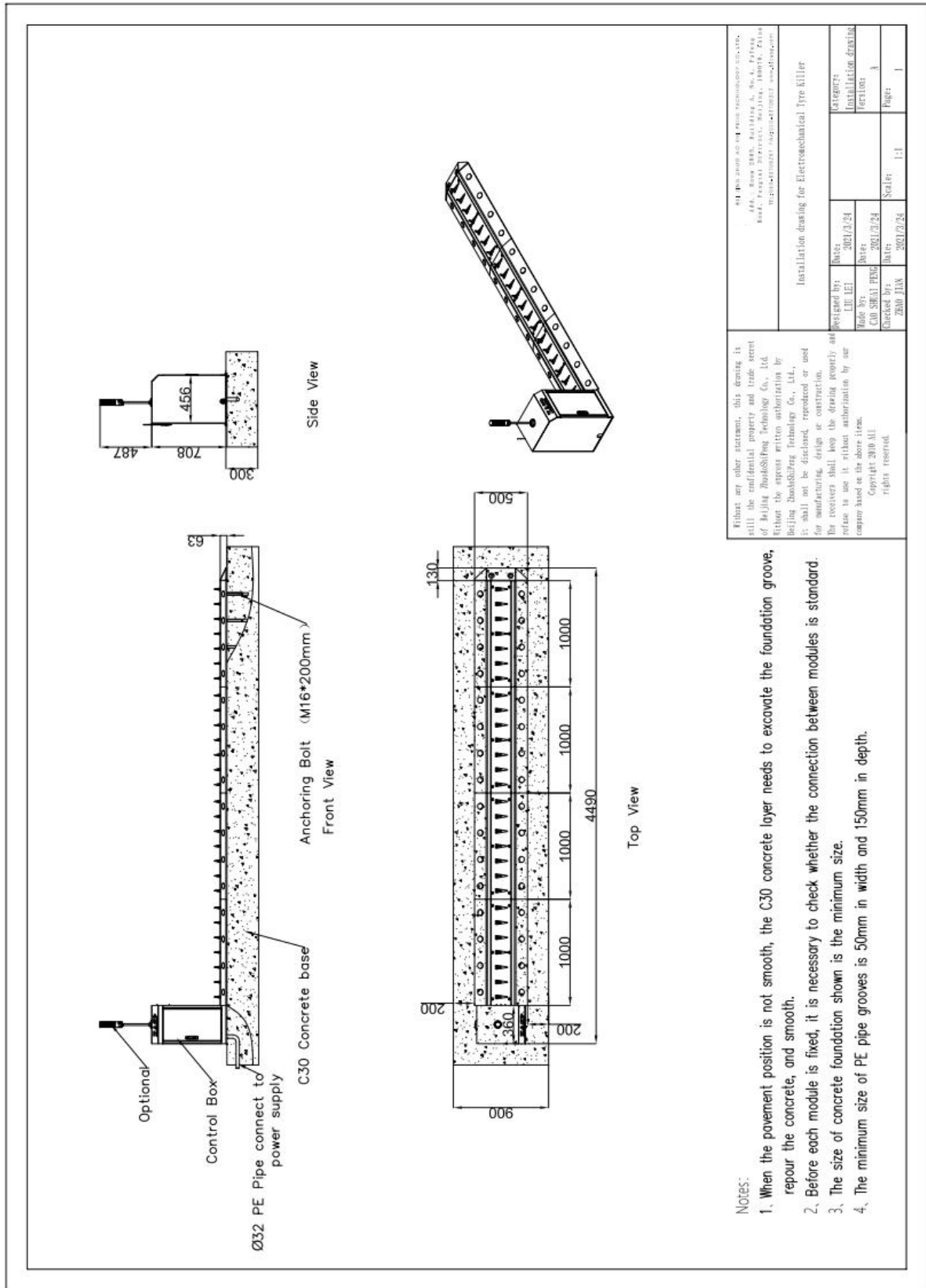
- According to the site environment and customer use requirements, confirm the best installation location to ensure convenient and smooth installation and achieve the overall aesthetic effect;
- Cement pavement, asphalt pavement, paving masonry pavement;
- Whether there are green belts, drainage wells, communication wells, open network power facilities;
- And to the relevant personnel to determine the location of pipelines, types, buried depth and other information;
- Measure the level of the ground in the installation position;
- The installation area near the well cover open observation line direction;
- Confirm the position of the power supply and meet the requirements of the equipment: AC 220 V, inform the relevant personnel to lead the main power supply to the equipment control box;
- Draw on the survey sheet and let the responsible person confirm;
- Whether two or more units are linked.

4.2 Receiving, Unsealing and Inspection

After the equipment is transported to the site, please remove the packaging and open box inspection within 3 days, test whether the equipment has the installation conditions, check the appearance of the equipment, such as serious bumps, falls, lack of parts, whether damp corrosion and so on. Confirm that the damaged should not be installed again. Check that the supporting instructions, drawings, tools, accessories and other accessories are complete. After checking, please re-pack, or do a good job of protection, keep in a well-ventilated, dry air warehouse.

4.3 Assembly and installation

4.3.1 Installation drawings:



4. 3. 2 Installation of construction processes and requirements:

- Installation of pavement leveling

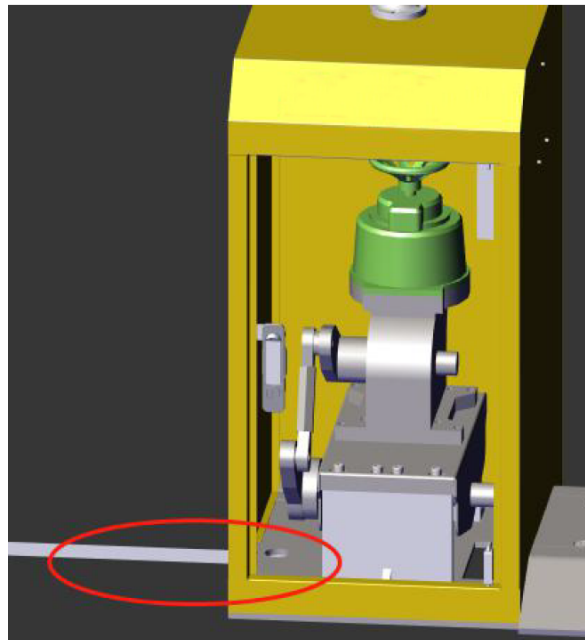
Clean the installation cement or asphalt floor of the reducer to ensure that the ground is flat and free of other debris. Check whether the installation position of the equipment is horizontal, if not horizontal, manual repair is required until horizontal. If the road surface is serious, it needs to be re-laid according to the installation position.

- Trenching of cables

According to the position of power supply and the installation position of Tyre Killer, the cable line position is determined, and the trench is excavated by electric hammer after cutting the road surface with cutting machine. Trench width 5 cm, depth 15 cm, pay attention to avoid underground pipelines. Align with the round hole of the bottom plate of the distribution box, if the ground is not convenient to slot, the cable protection casing can be laid above the road surface, and the power cable protection casing is a diameter $\Phi 32\text{mmPE}$ pipe.

- Laying of cables

A $\Phi 32\text{mmPE}$ pipe is used to lead the power cable to the power supply position, and the outlet hole of the equipment is sealed with foam glue or plastic to prevent cement from entering. After laying the cable pipe, the cable groove is back filled with concrete, and the road surface is leveled.



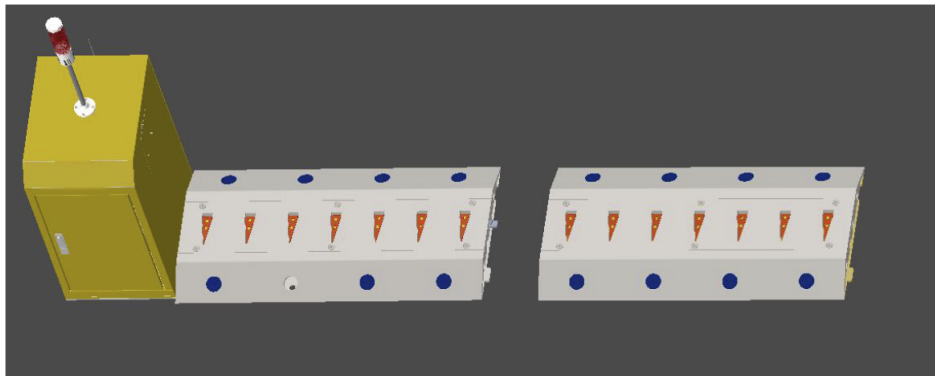
- Equipment combination installation

Place the Tyre Killer drive module in the installation position and install the coupling at the output shaft end. Set the standard module, the opening of the

shaft to the positive coupling, promote the standard module, so that the two modules face, alignment.

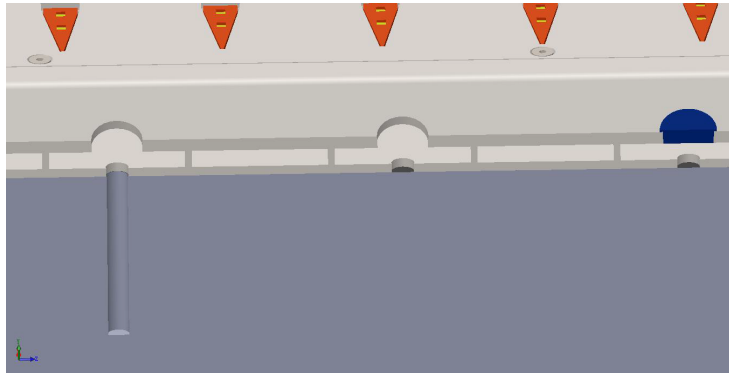


According to this installation method, the Tyre Killer module is connected in turn, and several standard blocks, couplings and the final end plug are installed together. (Note the alignment of positioning clamps between modules.)

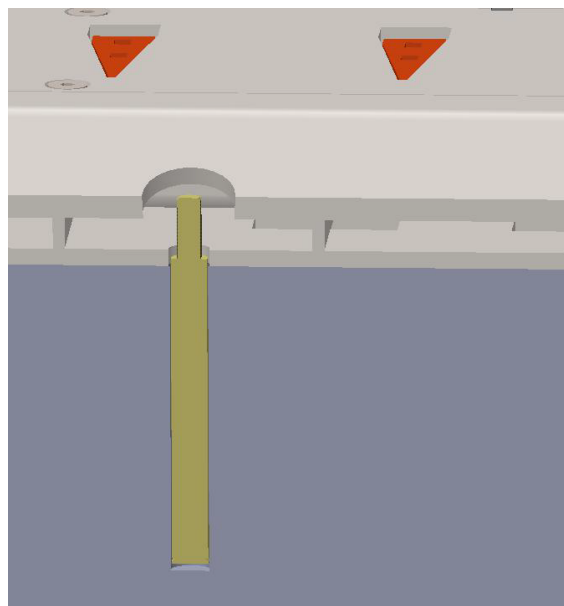


- Fixed equipment

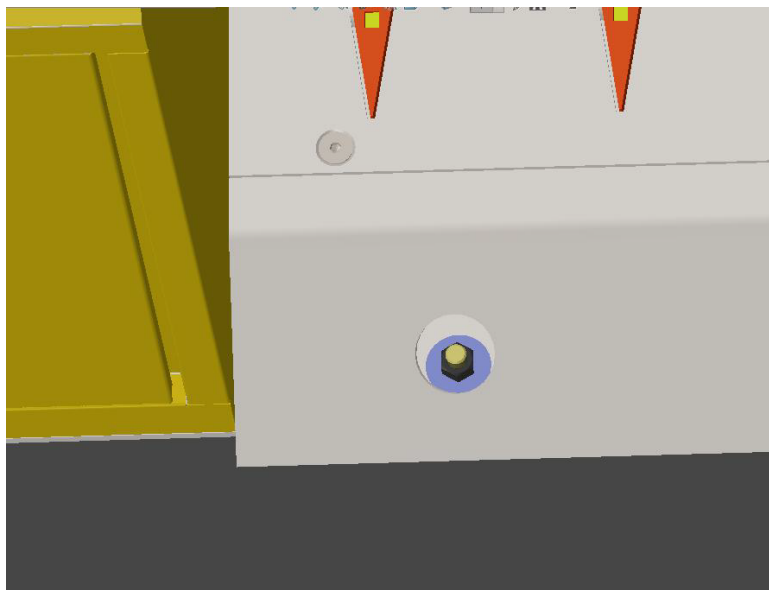
Place the Tyre Killer drive module in the position to be installed, and the bottom wire hole is aligned with the line slot. Remove the PVC plug from the Tyre Killer mounting hole, vertical downward from the Tyre Killer mounting hole position, use impact drill to drill fixed hole on the ground (chemical bolt drill $\Phi 20\text{mm}$ hole, expansion bolt drill $\Phi 23\text{mm}$ hole), depth $\geq 200\text{mm}$.

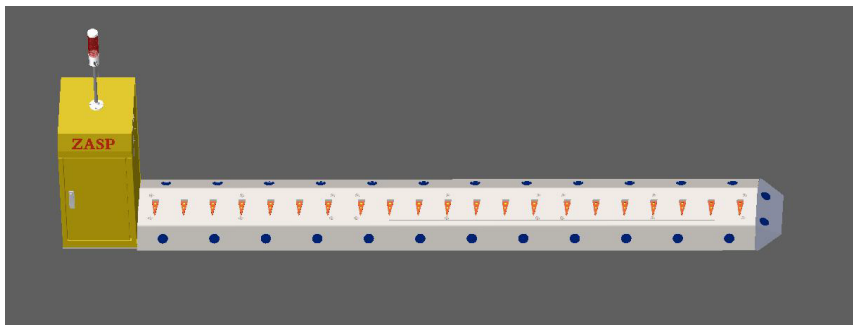


After all holes are finished as required above, the holes are nailed into the prepared chemical bolts (chemical bolt construction process) or expansion bolts.



After installing the expansion bolt, install the flat pad, elastic pad and nut, socket wrench, tighten the nut in turn, and fix the equipment with the ground.





- Wiring adjustment

Connect the power cable (rvv 3*2.5) of the Tyre Killer according to the electrical wiring diagram, operate the remote control rise and fall button, run the equipment several times, ensure the connection runs normally.

4. 3. 3 Chemical bolt construction process

Installation procedure: drilling - clearing - inputting medicament tube - drilling bolt (screw must be drilled with electric hammer, not directly knocked in) - gel process - hardening process - fixing object.

- 1) Drilling: based on the design requirements, according to the drawing spacing, edge distance to determine the position, drilling on the base, aperture and hole depth must meet the design requirements.
- 2) Clearing: use air pressure blowing pipe and other tools to remove dust from the hole to keep the hole clean.
- 3) Inputting medicament tube: insert medicament tube into clean hole, when inserted resin can flow like honey under hand temperature condition, use hose.
- 4) Drilling bolt: use electric drill to rotate the screw until the medicament flows out. Electric drill generally uses impact drill or hand drill, drilling speed is 750 rpm. At this point the bolt is rotated in, the medicament tube is broken, the resin, curing agent and quartz particles are mixed, and the void between the anchor bolt and the hole wall is filled. At the same time, the anchor bolt can also be inserted into the wet hole, but the water must be discharged from the borehole, and the waiting time for the gel process and the hardening process must be doubled.
- 5) Gel process: Keep installation tool stationary for chemical reaction time.
- 6) Hardening process: remove the installation tool and wait for the agent to harden. The chemical reaction time is as follows.
- 7) Fixing object: after the medicament is completely hardened, the object can be fixed with washers and hexagonal nuts.
- 8) Chemical Coagulation Schedule

Temperature greater than	20°C	10°C-20°C	0°C-10°C	-5°C-0°C
Dry concrete	10 minutes	30 minutes	60 minutes	3 hours
Wet concrete	30 minutes	60 minutes	2 hours	8 hours

4. 3. 4 Construction preparation, tools and related materials

4. 3. 4. 1 Equipment

- pavement cutting machine: used for cement ground cutting;
- excavator (with broken hammer): used for trenching;
- residue truck: used for residue transportation.

4. 3. 4. 2 Tools

- ink bucket: for ground slotted size marking;
- Infrared leveler: for equipment leveling;
- Tape measure: measuring pavement length and groove size;
- engineering line: for equipment leveling;
- angle grinder: for cable pipe or drainage pipe and other pipe cutting;
- impact drill: used for fixing control box or laying line pipe;
- Electric hammer: used to break the road surface, trench excavation;
- water drill drilling machine: used for wall opening;
- socket wrench S24(M16): used to fix the bolt of the Tyre Killer;
- concrete vibration rod: used for cement pouring vibration to eliminate concrete honeycomb pitting face;

4. 3. 4. 3 Main construction materials and consumables

- C30 concrete: used for cement pouring embedded cable casing;
- Φ 32PE pipe: used to protect embedded cable;
- RVV national standard soft sheath cable: control line RVV4*0.75 and power line RVV3*2.5;
- expansion bolts M16*200/ chemical bolts M16*190: used to fix the Tyre Killer;

5 Use of operating procedures



5. 1 Precautions before use:

- Check whether the control system is electrified and whether the input voltage meets the requirements;
- Check the remote control battery for electricity;

- Check the safety signs of the equipment before use, and read the instruction book carefully;
- Please pay attention to whether pedestrians and vehicles are in a safe area to avoid accidents;

5.2 Daily Operation Method

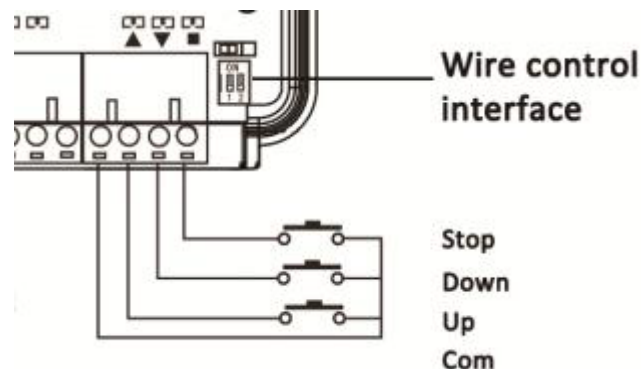
5.2.1 Wireless remote control operation

Wireless remote control has 3 buttons (according to the customer's different needs to install), respectively control equipment  (up),  (down), STOP (stop).



5.2.2 External button/linkage operation

Refer to the electrical wiring diagram, the Tyre Killer can access the operation button box or with other equipment for linkage operation. The signal is required to be a passive switch signal.

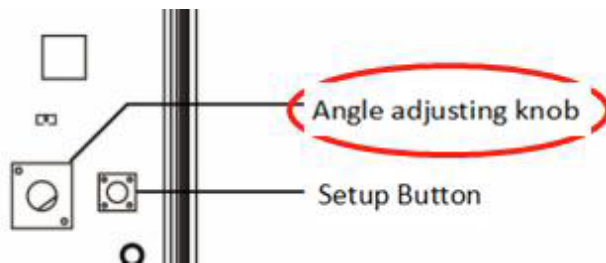


5. 2. 3 Emergency manual operation:

When the equipment is in the power outage, the control system can not start normally because of the power outage. The motor in the control box is equipped with manual wheel, which can be rotated manually to reduce the Tyre Killer. Rotate the handle counterclockwise, the Tyre Killer performs the rise action, the clockwise rotation handle, and the Tyre Killer performs the drop action.

5. 2. 4 Angle adjustment:

If the spikes are stuck or the lifting angle is not in place, it can be adjusted by the angle adjusting knob in the controller, the range is 60~90 degrees, the lifting angle is increased when rotating clockwise, and the lifting angle is reduced counterclockwise. The knob position refers to the electrical wiring diagram of the controller.



6 Safety Protection and Accident Handling



Warning

- Avoid frequent rise and fall in a short period of time, otherwise it will cause motor heating, resulting in motor stop operation or damage.
- Equipped with special remote control equipment, after use, the remote control should be properly placed, turn off the remote control power switch, to prevent accidents and injuries caused by mis-operation.
- Pay attention to pedestrians in ascending operation to avoid injury.
- When the equipment is not working properly, the rise and fall is finished, press the stop key once to avoid the damage of the electrical components and can not stop, resulting in the motor burning.
- It is strictly prohibited to fill the gap around the equipment with sediment and debris, so as not to affect the normal rise and fall of the equipment.
- It is strictly forbidden to carve on the surface of the control box, causing damage.
- Keep the equipment clean and tidy.

7 Maintenance

Regular inspection and maintenance are the basis for ensuring that equipment works with optimal efficiency. Note the following when maintaining equipment:

- Monthly check whether sprocket chain right serious wear, according to wear, regular replacement;
- Add chain oil or oil to chain sprocket according to site environment and climate;
- Electrical maintenance should be cut off the power supply, and in prominent position hanging maintenance, maintenance signs;
- The remote control distance is too short, please check if the receiver is shielded by metal, or the battery power is insufficient. Remote control distance is greatly affected by the weather, in the rain, fog, wind, snow and other bad weather conditions, or due to the use of remote control equipment, there is the same frequency interference in the region, remote control distance has been shortened, belong to the normal phenomenon;
- List of equipment maintenance contents and cycles:

Mandate	Every day	Monthly	Quarterly
Check the remote control battery for electricity	✓		
Check that the empty button is normal		✓	
Check that terminal screws are loose		✓	
Check that the equipment component screws are loose		✓	
Regular inspection of fastening joints		✓	
Dust removal on surface of electrical control cabinet		✓	
Dust removal in electrical control cabinet		✓	
Equipment surface dust removal		✓	
Open the cover plate to clean up dirt or debris in the Tyre Killer			✓

8 Common Fault Analysis and Troubleshooting

8.1 Troubleshooting

- Common causes of equipment failures and troubleshooting methods are shown in the table below

Fault characteristics	Failure, cause, and location		Exclusion methods	
Can not start	1	Power not connected	1	Check and power on
	2	Leakage Protector	2	Replacement
	3	Control panel	3	Replacement
	4	Poor contact of control output	4	Check Control Output
	5	Motor malfunction	5	Replacement
The Tyre Killer is not in place	1	Trapped inside the tyre breaker	1	Removal of residues
	2	Time of decline normal	2	Check system time
Abnormal sound in control box	1	Check for loose electrical	1	Fastening Loose Components
	2	Check if lines and terminals are	2	Fasten loose virtual terminal
	3	Check that the measured voltage is stable	3	Contact electrical workers to overhaul power supply
Electrical components no signal	1	Damage to electrical components	1	Replacement or repair
	2	Electrical component wiring error	2	Repair normal connection
	3	Correct wiring	3	Normal connection according

Note: the user can not troubleshoot the fault should be timely contact with the company's after-sales service department, under the correct guidance of troubleshooting, not unauthorized disassembly, so as not to cause unnecessary losses.

8.2 List of vulnerable parts

Serial number	Name of Accessories	Specifications	Quantity
1	Industrial chain	08B double row spacing 12.7	1
2	Coupling	Self-made	1
3	Engineering plastic bearings	G 28*32*20B2=2	2
4	Sinking stainless steel bolt	M 10*20	2

9 Transport and storage

- **Hoisting:** when the Tyre Killer is installed on site, it can be hoisted from the installation hole or hook.
- **Transportation:** the Tyre Killer needs to be packed in a special packing box to carry out long-distance transportation.
- **Storage conditions:** the Tyre Killer should be well ventilated, dry air, not wet, ambient temperature -10°C -40°C range, clean and clean no harmful gas, no conductive dust, no corrosive gas that destroys metal and insulation, no explosive gas indoor storage. The Tyre Killer is installed in the packing box and no other goods are allowed on it. It is strictly forbidden to reverse the package, put it upside down, and strictly prohibit overturning.
- **Storage period:** from the date of departure, the storage period is 12 months under the above storage conditions.