
电子围栏系统（铝合金杆子）安装说明书

Instruction for Installation of Electric Fence System
(Aluminum Alloy Pole)

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电子围栏系统总体施工说明

Instructions for General Construction of Electric Fence System

1 施工的工具及材料 Tools and materials for construction

1. 工具：冲击电钻、拉铆枪、钢丝钳、扳手、螺丝刀、电烙铁、登高梯、安全带等工具。
Tool: impact electric drill, rivet gun, wire-cutter, spanner, screw, electric soldering iron, ladder, safety belt, etc.
2. **RS485 信号控制线：**RVSP2×1.0mm²圆形双绞线（强磁干扰场所应选用 RVSP2×1.0mm²双绞屏蔽线；距离大于 1200 米时应加 RS485 中继器）；围栏控制器电源线：RVV2×1.5 mm²的护套线。
RS485 signal control wire: RVSP2×1.0mm²circular twisted-pair (for strong magnetic interference places RVSP2×1.0mm² twisted shielded pair should be applied; in case of the distance more than 1,200m, RS485 repeater should be added); fence controller power line: RVV2×1.5 mm² sheath wire.
3. PVC 穿线管（φ25）及其配件。
PVC threading pipe (φ25) and its fittings
4. 警示灯及“电子围栏 禁止攀爬”警告牌若干。
Several warning lights and warning signs of “Electronic fence, no climbing”

2 周界施工 Perimeter construction

2.1 周界围栏杆子万向底座安装角度：（与墙顶面的夹角）Installation angle of perimeter fence rod universal base: (Angle with wall top surface)

- ✧ 根据现场的情况及甲方要求确定周界围栏角度（0°、22.5°、45°、67.5°、90°、112.5°、135°、157.5°、180°）和倾斜方向（内倾式、外倾式、垂直式或水平式安装）
- ✧ According to the site condition and the requirement of party A, confirm the perimeter fence angles (0°, 22.5°, 45°, 67.5°, 90°, 112.5°, 135°, 157.5°, 180°) and inclination directions (introversive type, extroversive type, vertical type or horizontal type installation)



承力杆安装方式



终端杆安装方式

Installation of load-bearing rod

Installation of terminal rod

- ✧ 根据周界环境：居民区、学校附近建议为内倾或垂直安装，空旷地带建议为外倾，围墙高于 2.5 米时可以采用水平安装。
- ✧ According to perimeter environment: introversive or vertical installation is recommended if there is community or school nearby, extroversive installation is recommended for open field and horizontal installation is applicable to the case of wall higher than 2.5m.
- ✧ 根据保护对象：防止外界入侵时建议为外倾式安装，防止内部翻越时建议为内倾式。
- ✧ According to protected object: extroversive installation is recommended for the prevention of outside intrusion and introversive installation is recommended for the prevention of climbing from inside.

2.2 组装杆子 Terminal rod assembly

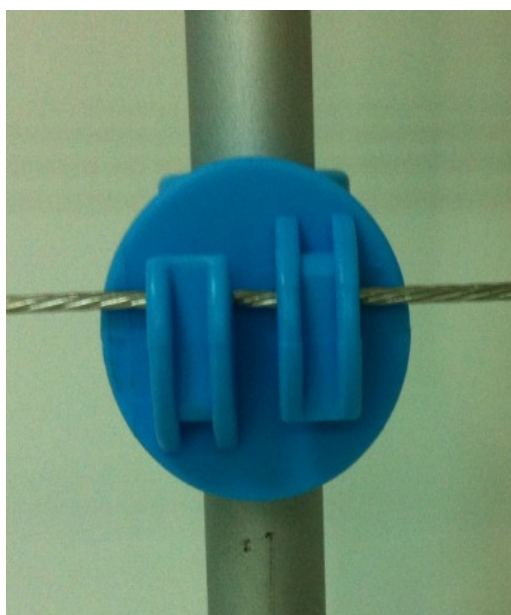
2.2.1 承力杆安装方法：Installation of load-bearing rod:

- ✧ 将承力杆绝缘子套入中间杆，然后用 M4*10 自攻螺丝将绝缘子固定在杆子上。注意套入距离。保证每条线之间的距离 200mm、最下一根线距墙顶为 200mm（上海地区规定为 150mm），将绝缘子挂线槽开口调整为同一方向然后旋紧。如下图：
- ✧ Put load-bearing rod insulator on middle rod and fix it with M4*10 self-tapping screw. Pay attention to the position. Make sure the distance of each wire is 200mm and the distance between bottom wire and wall shall be 200mm (it is regulated as 150mm in Shanghai area), adjust the wire hanging groove of the insulator into a unified direction and screw them up. As shown in the figure below:



承力杆绝缘子安装方式

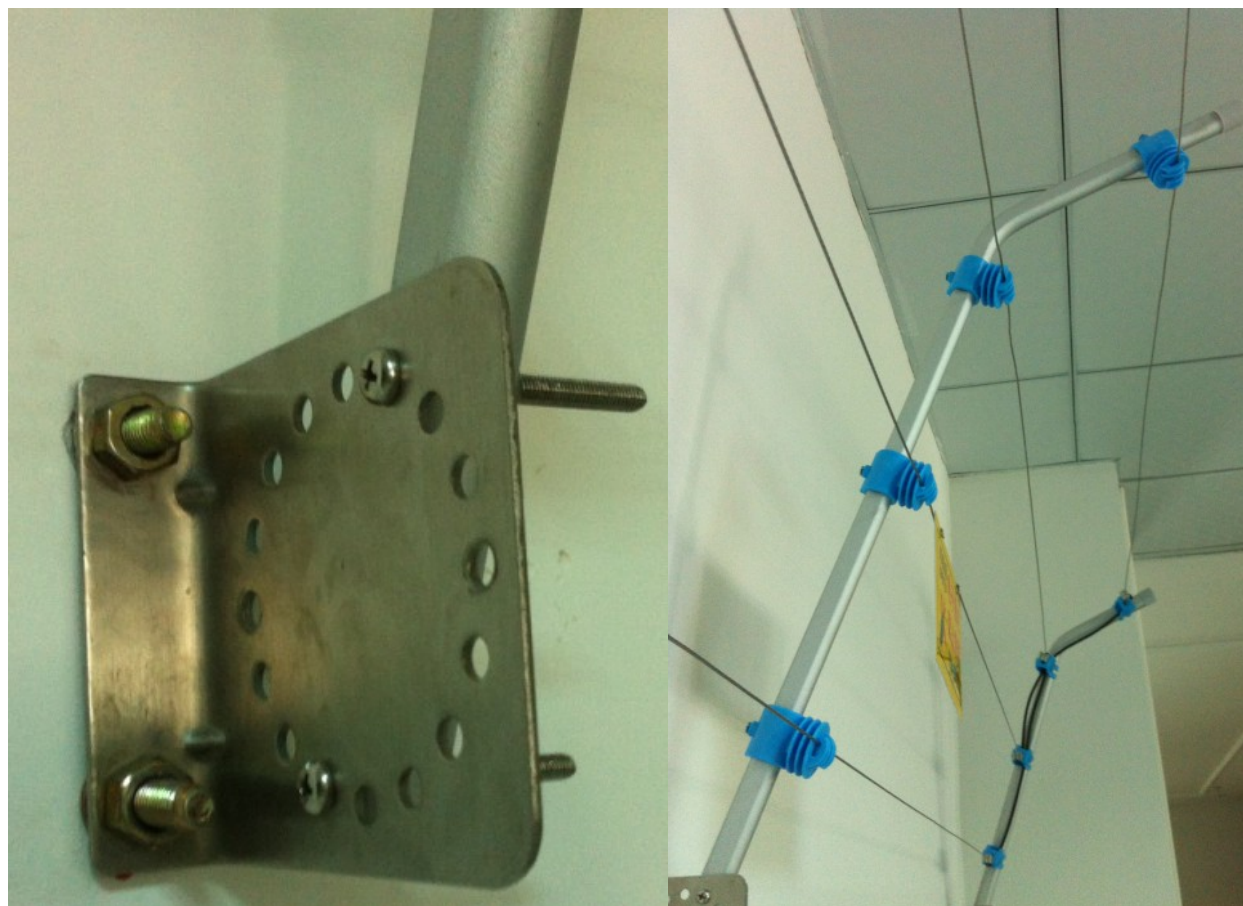
Installation of load-bearing rod insulator



承力绝缘子挂合金线、警示牌的方式

Installation of load-bearing rod insulator with alloy wire and warning sign

- ✧ 承力杆用 M5×30 不锈钢螺栓将承力杆固定在万向底座上（注意：围栏合金线方向与万向固定座两固定孔的连线相互垂直，安装倾角符合 1 项要求）
- ✧ The load-bearing rod is fixed on the universal base by M5×30 stainless steel screw (Note: the direction of fence alloy wire shall be vertical to the line connecting two fixing holes of the universal base)



承力杆万向底座固定方式及承力杆安装完成的效果图

Effect drawing of the completed installation of load-bearing rod fixed on universal base

2.2.2 终端杆安装方法: Installation of terminal rod

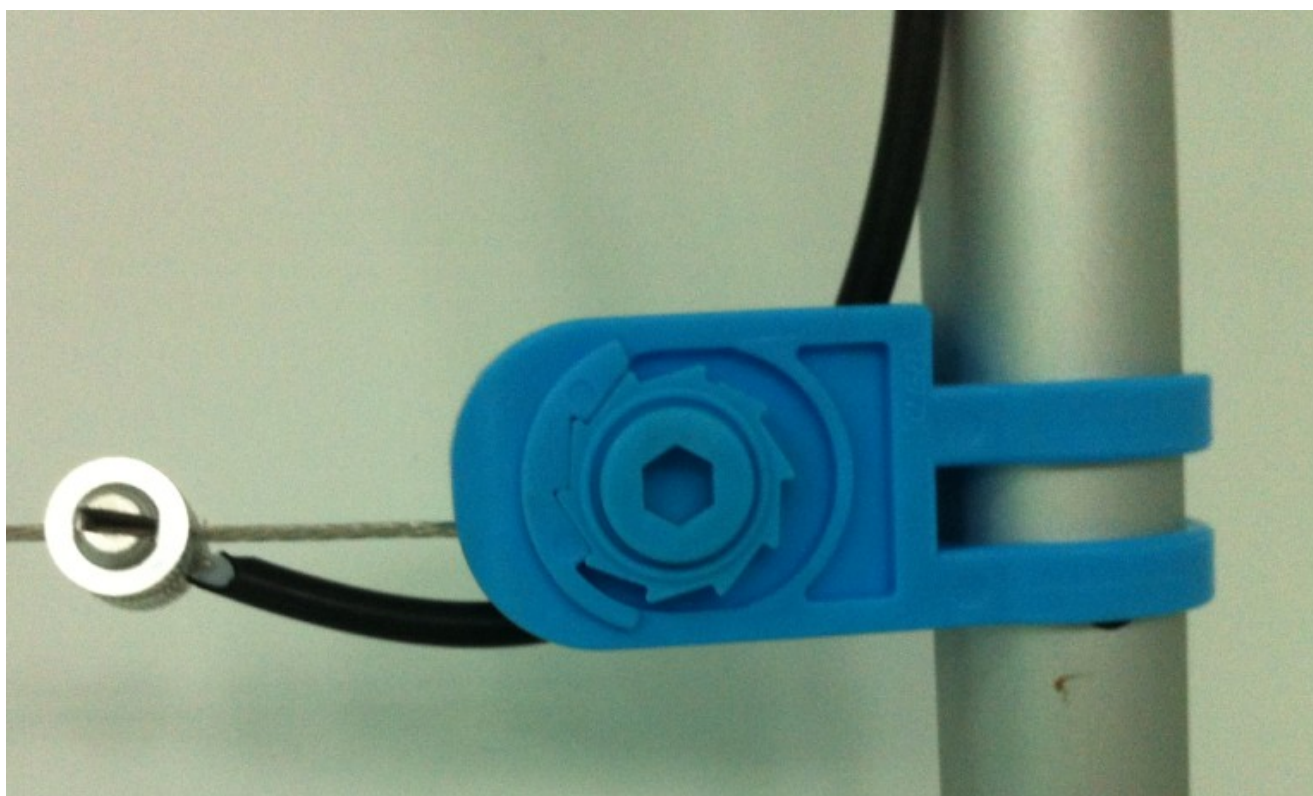
✧ 如图: 用 M5×45 螺栓将终端杆固定在两个万向底座之间。(注意: 围栏合金线方向与万向固定座两固定孔的连线相互垂直, 安装倾角符合 1 项要求)。

- ✧ As shown in figure: fix the terminal rod in the middle of two universal bases by M5×45 screw. (Note: the direction of fence alloy wire shall be vertical to the line connecting two fixing holes of the universal base, inclination angle of installation meets 1 requirement).



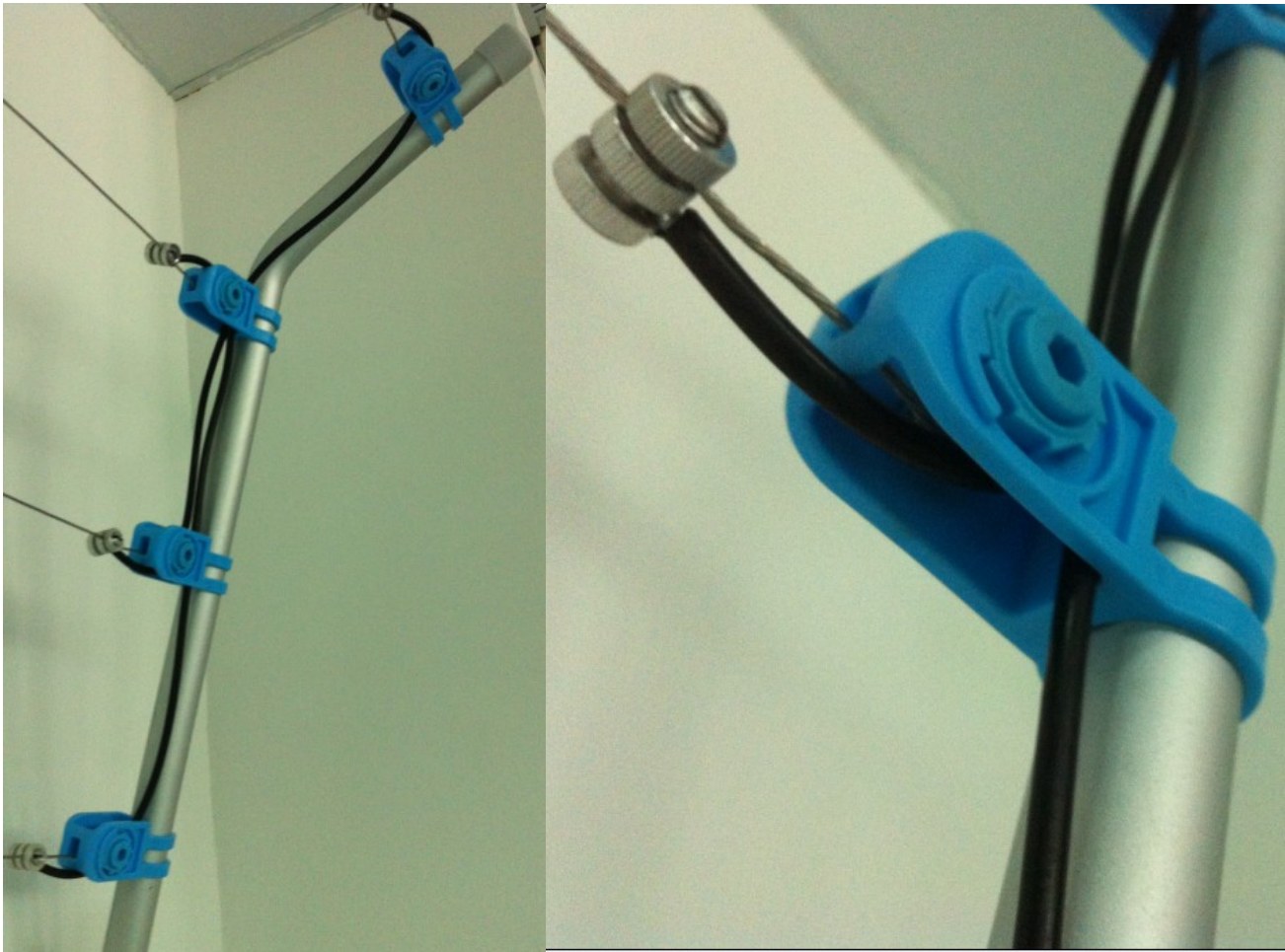
终端杆万向底座安装方式

Installation of terminal rod fixed on universal base



终端杆绝缘子（塑胶蓝色）及线线连接器（银白色）的安装方式

Installation of terminal rod insulator (plastic blue) and wire connector (silvery white)



终端杆末端高压线（黑色）连接方式

Connection of terminal rod end high voltage wire (black)



相邻两个防区共用一根终端杆的安装方式

Installation of terminal rod shared by two adjacent defense areas

- ✧ 将终端杆绝缘子套进终端杆中，然后用 M4*10 自攻螺丝将绝缘子固定在杆子上。注意套入距离。保证每条线之间的距离 200mm、最下一根线距墙顶为 200mm（上海地区规定为 150mm），注意螺丝的固定方向要一致的。
- ✧ Put terminal rod insulator on the terminal rod and fix it on the rod by M4*10 screw. Take care of the fitting depth. Make sure the distance of each wire is 200mm and the distance between bottom wire and wall shall be 200mm (it is regulated as 150mm in Shanghai area), note that the screw fixing direction must be consistent.
- ✧ 每一个电子围栏主机的地方都应有一根终端杆，及避雷器（避雷器用 L 型支架安装在主机附近的墙体上）。

- ✧ Each place with an electronic fence controller should have a terminal rod and lightning arrestor (the arrestor shall be fixed on the wall near the host by L brackets).

3.合金线安装： Installation of alloy wire

- ✧ 围栏线应采用分段安装的方式固定，同一条直线或同一防区建议分为一段。不在同一条直线上的网线分几次安装。
- ✧ The fence should be fixed by sectional installation. The same line or defending area is recommended as one section. Wires not in the same line should be installed separately.
- ✧ 展放合金线：采用放线架或适当方式放线，切莫任意放，以免出现打结和不平整现象。可以四根同时展放，但注意不要交叉。
- ✧ Alloy wire pay-off: use pay-off rack or proper way to pay off the wire. Do not pay off the wire wantonly in order to avoid knotting and unsmoothness. Pay-off of four wires at same time is available but be careful not to cross.
- ✧ 紧线：将合金线的一端传入终端杆绝缘子中心轴的线孔中（如图 1）；将穿入的合金线沿着中心轴缠绕一周（如图 2）；将所有的合金线一次穿好之后，用内六角扳手拧动终端杆绝缘子收紧合金线。
Wire fix: get one end of alloy wire into the hole in the center of the central shaft of the terminal rod insulator (as shown in figure 1); wind the wire around the central shaft for a round (as shown in figure 2); after all alloy wires winded, screw the terminal rod insulator by inner hex key to tighten the alloy wire.

✧



终端杆绝缘子（图 1）

Terminal rod insulator (figure 1)

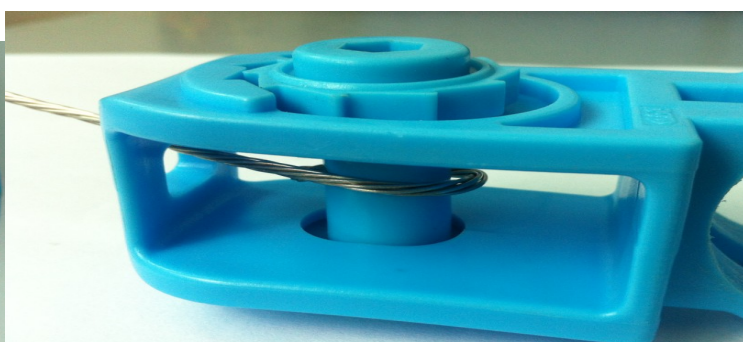


终端杆绝缘子、合金线（图 2）

Terminal rod insulator, alloy wire (figure 2)



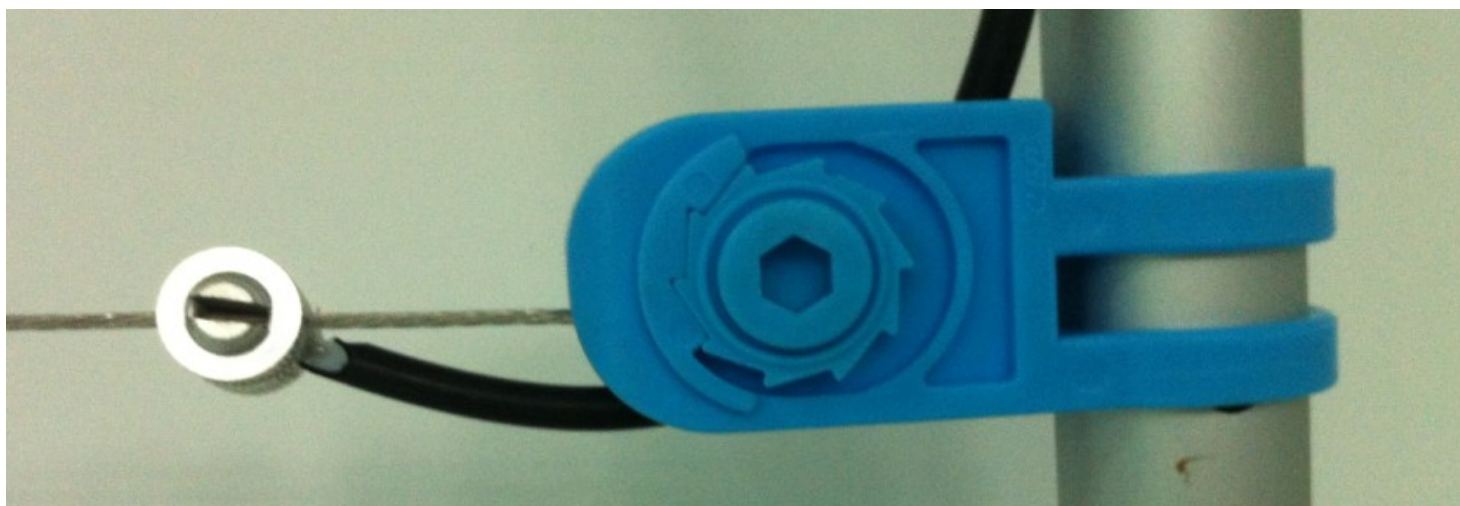
终端杆绝缘子缠绕合金线（图 3）



Terminal rod winded by alloy wire (figure 3)



用内六角扳手拧终端杆绝缘子侧边的卡位，收紧合金线
Screw one side of the terminal rod insulator by inner hex key to tighten alloy wire



用线线连接器将高压线与合金线连接起来
Connecting high voltage wire with alloy wire by wire connector

4 接地体、线材铺设、主机安装：Layout of earth electrode and wires and host installation

4.1 接地体的制作 Make of grounding electrode

每个围栏控制器箱下必须打入两个接地体，接地体标准：大于 $50 \times 50 \times 5 \times 1500 \text{mm}$ （有 M10 以上的接地螺栓或孔）标准镀锌接地角铁，垂直打入地下，接地体与避雷器支架、围栏控制器箱接地端可靠连接，接地电阻 $< 10 \Omega$ 。不够时可加入降阻剂。强电接地与弱电接地必须相互隔离，并且必须有 $> 4 \text{m}$ 的距离，还有一个接地就是在防区的开始或者是结束的地做一个总的 485 信号线屏蔽层接地，接地标准同上。

Under each fence controller two grounding electrode must be set up. The standard of grounding electrode is: the standard zinc-plated grounding angle iron of more than $50 \times 50 \times 5 \times 1500 \text{mm}$ (with grounding bolt or hole larger than M10) shall be vertically fixed into the ground and connected with lightning arrestor bracket and earth terminal of fence controller box with an earth resistance less than 10Ω . If the resistance is not adequate, resistance reducing agent can be added. Heavy current grounding and weak current grounding must be separated with a distance more than 4m . Another grounding which is at the beginning or the end of the defending area is a general grounding for shielded 485 signal wire. The grounding mode is the same as above.

4.2 RS485 信号控制线、围栏控制器电源线的铺设：Layout of RS485 signal control wire and fence control power wire

若有预埋管道则可直接利用，否则利用 PVC 管进行穿管敷设，敷设要求符合管道配线要求，管道中主要有：RS485 信号控制线 RVSP2 $\times$ 1.0mm²圆形双绞线、围栏控制器电源线 RVV2 $\times$ 1.5 mm²的护套线（从主机并接到每个围栏控制器上，距离超过 600m 需加大线径）。

Make use of the embedded pipes if any, otherwise install wires in PVC pipes. The requirement of laying shall comply with conduit wiring requirement. Inside the pipe there are: RS485 signal control wire, RVSP2 $\times$ 1.0mm² circular twisted-pair, fence controller power line and RVV2 $\times$ 1.5 mm² sheathed wire (parallel connected from the host to each fence controller and the wire diameter should be increased in case of distance more than 600m).

4.3 警示牌的安装：Installation of warning sign:

每隔 10 米安装“电子围栏 禁止攀登”警告标识牌一块，可以用合金线固定在围栏线上。

Every 10 meters install a warning sign of “Electric fence, no climbing” which can be fixed on fence wire by alloy wires.



4.4 围栏控制器的安装: Installation of fence controller:

- a) 将围栏控制器安装于围栏下方、围栏分区处，用膨胀螺栓固定于墙上。
Fix the fence controller which is installed under the fence or at the partition of the fence to wall by expansion bolt.
- b) 将围栏控制器与接地扁铁作良好的连接。围栏控制器接地（弱电接地，于通讯线屏蔽层相连），与高压围栏接地（强电接地）相互隔离，避免干扰。
Well connect the fence controller with the grounding iron. The fence controller grounding (weak current grounding connected with shielding layer of communication wire) and high voltage grounding (heavy current grounding) should be separated to avoid interference.
- c) 将围栏控制器的高压引线通过 PVC 配线管与围栏相接，接头处应采用线线连接器（或自我缠绕）可靠连接。
Get the high voltage wire of fence controller through the PVC conduit and connect it with fence. The wire connection should be connected firmly by wire connector (or by self-winding).
- d) RS485 总线、报警输出线、及电源线与高压线分开，使用单独的配线管。
The RS485 general wire, alarm output wire and power wire should be separated from high voltage wire and should use independent wiring conduit.
- e) 将高压避雷器可靠连接于周界围栏起始端与地线之间（注意防水方向）
Connect the high voltage lightning arrestor between the beginning of the fence and grounding wire (take care of the waterproof direction).

附件 前端系统接线图（见下图）

Appendix Wiring diagram of front-end system

