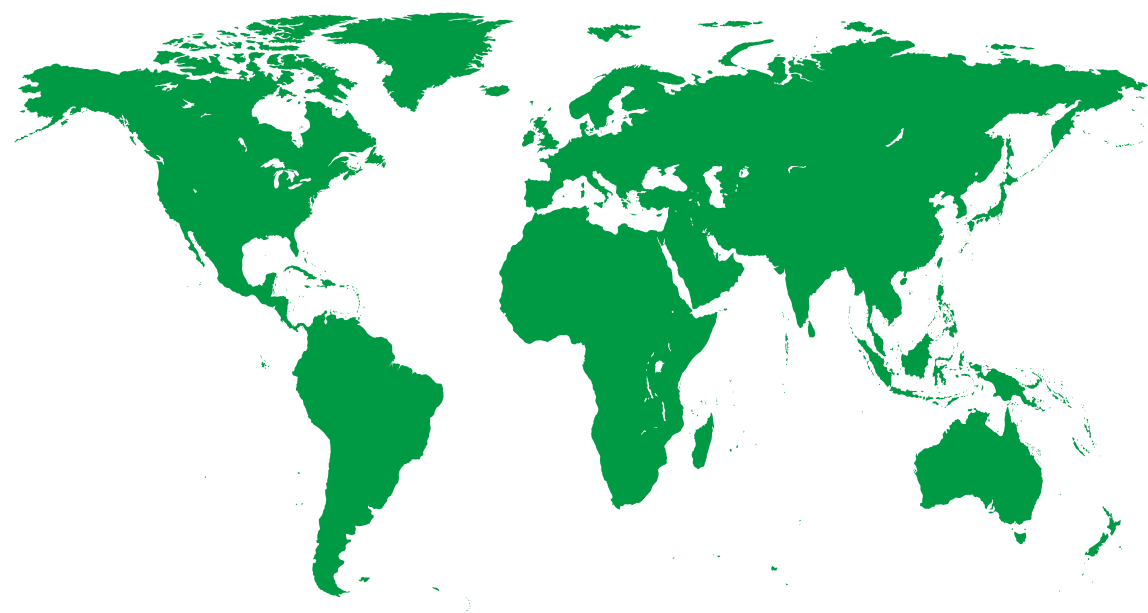




PRODUCT SELECTION GUIDE

产品选型手册



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浙江格亚电气有限公司
ZHEJIANG GEYA ELECTRIC CO., LTD.

■ 电感式传感器型号说明: Model specification

LJ □ 18 A 3 □ - 8 - Z / B X
<1> <2> <3> <4> <5> <6> <7> <8> / <9> <10>

- 1、**开关代号**：LJ:接近开关
- 2、**开关种类**：□：电感式；C：电容式；G：干簧管式
- 3、**开关尺寸**：8：8mm；12：12mm；18：18mm；30：30mm
- 4、**结构形式**：A：圆柱形；B：方形
- 5、**外壳材料**：3：金属外壳；4：塑料外壳
- 6、**紧固方式**：□：螺纹管；1：光杆
- 7、**检测距离**：2：2mm；4：4mm；8：8mm；15：15mm
- 8、**电源电压**：Z：DC6-36V；Z1:DC30-65V；J:AC90-250V；J1:AC345-400V
- 9、**输出状态**：A：三线常闭；B：三线常开；C：四线常开加常闭；
D：二线常闭；E：二线常开
- 10、**输出形式**：X：NPN 200mA；Y:PNP200mA；Z:300-400mA；M:500mA

- 1、Switch code: LJ:Proximity switch
- 2、Switch type: □: Inductive type; C: Capacitive type;G:Reed Switch
- 3、Switch size: 8: 8mm; 12: 12mm; 18: 18mm; 30: 30mm
- 4、Structure: A: Cylindrical; B: Square
- 5、Shell material: 3: Metal shell; 4: Plastic shell
- 6、Fastening method: □: Thread tube; 1: Polish rod
- 7、Detection distance: 2: 2mm; 4: 4mm; 8: 8mm; 15: 15mm
- 8、Voltage: Z: DC6-36V; Z1:DC30-65V; J:AC90-250V; J1:AC345-400V
- 9、Output status: A: Three-wire NC; B:Three-wire NO; C: Four-wire NO+NC;
D: Two-wire NC; E: Two-wire NO
- 10、Output Type: X: NPN 200mA; Y:PNP200mA; Z:300-400mA; M:500mA

- **外壳材料** Housing material
- 黄铜镀镍 Nickel plated brass
- 耐热ABS Heat resistant ABS
- 不锈钢V2A Stainless bronze V2A

- **电缆材料** Cable material
- PVC 用于电子工业的标准电缆，能耐油，油脂及耐腐蚀。
- 为了防止电缆的断裂，当环境温度在-5℃或更低时，PVC电缆不要多移动。
- PVC Standard cable used in the electronic industry, oil and grease resistant, and corrosion resistant.
- To avoid the cable breaking, when the ambient temperature is -5℃ or below, don't move the PVC cable frequently.

- **圆柱型接近开关** Cylindrical type proximity switch
- 这种开关的感应面在开关的顶部，垂直于开关的轴线。
- 开关尺寸：从光杆4mm~螺纹47mm
- The inductive surface of this kind of switch in on the top of the switch and along the vertical direction to the axis of the switch
- Switch dimension: 4mm from the polish rod ~ 47mm thread

- **限位安装型接近开关** Limit mounted type proximity switch
- 这种开关是参照Varikont和Varikont M型的安装孔结构而设计，符合EN 60947欧洲标准(IC30及IC40)，此结构与机械式的行程开关的安装孔一样。
- Varikont由一个坚固的基座(PBT)，用螺丝安装固定，内部是接线端子。上盖由ABS制成，有带编号的插针及内含开关放大器，上盖和基座用橡胶密封。
- 传感器头部可以按5个方向进行转换，例如感应面在上部，底部，左面，前面，右面。
- This switch is designed in terms of the mounting hole structure of Varikont and Varikont M type, meeting the EN 60947 European Standard (IC30 & IC40). The structure is the same as that of the mounting hole of mechanical type travel switch.
- Varikont is made up of a firm foundation support (PBT), installed and fastened with screws and inside is the connecting terminal. The upper cover is made of ABS, owning contact pin with numbers and a switch amplifier inside. The upper cover and the foundation support are sealed with rubber gasket ring.
- The sensor head can convert in 5 directions, for instance, the inductive surface is on the top, bottom, left, front and right side.

- **平面安装型接近开关** Surface mounted type proximity switch
- 这种接近开关有较大的感应面(80mm×80mm)，因此具有较大的检测范围。
- 结构同限位安装型一样，安装孔为ID80。
- This proximity switch has a larger inductive surface (80mm×80mm), leading to a larger detection range.
- The structure is the same as that of the limit mounted type, and the mounting hole is 1D80

- **螺丝安装型(角柱型)接近开关** Screw mounted type (Angular column type) proximity switch
- 这种接近开关是用螺丝安装在开关表面，感应面可以在顶端或前面，外壳材料通常为耐热ABS。
- This proximity switch is mounted on the switch surface with screws. The inductive surface can be on the top or in the front and the housing material is generally heat resistant ABS.

- **槽型接近开关** Slot type proximity switch
- 这种开关由耐热ABS制成，具有U型的外型；交变磁场产生在位于U型二个“臂”上的线圈之间，当金属物体通过二个线圈之间的区域，开关被激活；槽型开关可以用于机械限位控制。
- This switch is made from heat resistant ABS with a U type shape, and the alternating magnetic field comes in the coil between the two “arms” of the U type. When metallic objects go through the area between the two coils, the switch is activated. Slot type switch can be used for mechanical limit control.

- **环型接近开关** Ring type proximity switch
- 这种开关由耐热ABS制成，具有环型的外型；交变磁场集中在环内，当金属物体通过圆环时，开关被激活。
- This switch is made from heat resistant ABS with a ring type shape, and the alternating magnetic fields centralize in the ring. When metallic objects go through the circle, the switch is activated.

动作距离 Action distance

动作距离是接近开关的最重要参数，它主要是取决于传感器的直径(线圈或电容器)，外型及感应目标的材质及环境温度也影响感应的范围。

对于磁性接近开关，安装及磁体的强度同样必须要考虑。

动作距离的定义：除槽型及环型以外，其定义符合EN60947-5-5-2标准。

接近开关的动作方式有两种：轴向接近，径向接近。

Action distance is the most important parameter of the proximity switch. It depends mainly on the diameter of the sensor (coil or capacitor), and external shape, induction object material and ambient temperature also affect the inductive range.

For magnetic proximity switch, installation and magnet strength must be considered as well.

Definition of action distance:

The definition meets EN60947-5-5-2 Standard, except slot type and ring type.

Proximity switch has two action modes: Axial proximity , Radial proximity.

以下所有的参数是按轴向接近的方式来定义 All parameters mentioned below are defined in terms of the axial proximity mode

额定感应距离Sn Rated sensing distance Sn

它是一个标准值，不考虑外部环境影响。It's a standard value without regard to the influence of external environment.

标准检测片 Standard detection sheet

检测片设计成正方形，厚度为1mm；材料为ST37，表面光滑，它的边长为3×Sn。

The detection sheet is designed into square type. The thickness is 1 mm, the material is ST37 with smooth surface and the side length is 3×Sn

检测目标尺寸或材料的改变会衰减感应范围。The alternation of the detection object dimension or material will attenuate the inductive range.

有效动作距离Sr Effective action distance Sr

开关在额定工作电压及室温下(23±5℃)测得的动作距离：0.9Sn≤Sr≤1.1Sn

The action distance detected at the rated operating voltage and room temperature (23±5℃): 0.9Sn=Sr=1.1Sn

可用动作距离Su Practicable action distance Su

开关在允许的环境温度-25℃~+70℃下，输入电压在额定电压的85%到110%的范围内，测得的动作距离：0.9Sr≤Su≤1.1Sr

The action distance detected when the input voltage is in the range of 85% to 110% the rated voltage and the switch works at the allowable ambient temperature -25℃ to +70℃: 0.9Sr=Su=1.1Sr

可靠动作距离Sa Reliable action distance Sa

测量目标在这个动作距离内，开关的动作是可靠的 0≤Sa≤0.81Sn

When the measure object is in this action distance, the action of the switch is reliable: 0=Sa=0.81Sn

重复精度R Repeatability precision R

是指在环境温度(23±5℃)，相对温度为随机的，供电电压为Ue±5，在8个小时的范围内进行测量所产生的有效作用距离的变化量：R≤0.1Sn

It is the convert value of the effective action distance that is measured in 8 hours when the ambient temperature is 23±5℃, relative humidity is random and the service voltage is Ue±5; R=0.1Sn

确保开关断开距离 Ensure the switch breaking distance

当检测片到开关感应面的距离大于倍的额定动作距离时，确保开关断开。

When the distance between the detection sheet and the switch inductive surface is larger than the rated action distance, ensure the switch is disconnected.

衰减作用 Attenuation

衰减系数是指某一种材料的动作距离相对于用St37号钢作检测片时减少了多少。

对于电感式接近开关而言，检测片材料的导电性是影响衰减系数的主要参数。

Attenuation coefficient means how much the action distance of a certain kind of material is attenuated when St37 steel is used as detection sheet

For inductive type proximity switch, the electrical conductivity of the detection sheet material is the main parameter affecting attenuation coefficient

下面列出一部分材料的衰减系数

The attenuation coefficient of some materials is listed below

材料 Material	衰减系数 Attenuation Coefficient
钢 Steel	1
不锈钢 Stainless steel	0.85
铝 Aluminum	0.4
黄铜 Brass	0.4
铜 Bronze	0.3

电容式接近开关则以接地的金属为参考。While capacitive type proximity switch takes the earth metallic plate as reference.

下面列出一部分材料的衰减系数 The attenuation coefficient of some materials is listed below

材料 Material	衰减系数 Attenuation Coefficient
接地板 Earth plate	1
水 Water	1
酒精 Alcohol	0.75
陶瓷 Ceramic	0.6
PVC	0.45

关于检测体的电镀 About the electroplating of detection object

检测体的表面如作电镀处理，动作距离会发生变化；特别是铁作表面处理后，根据电镀种类不同动作距离会缩短10~30%。

If the surface of detection object is electroplated, the action distance will change, especially after iron is surface treated. The action distance will be shortened 10~30% in terms of the electroplate kind

安装 Installation

圆柱型接近开关 Cylindrical type proximity switch

非屏蔽式接近开关可以获得最大的动作距离(与直径有关)；但为了防止开关周围的金属对开关影响，开关感应头必须与周围的金属保持一定的间隙。(图1)

屏蔽式接近开关由于内部特殊的屏蔽作用，使侧面径向的磁场减小，感应距离大约是非屏蔽式的60%，因以可以齐平安装在金属内。(图2)

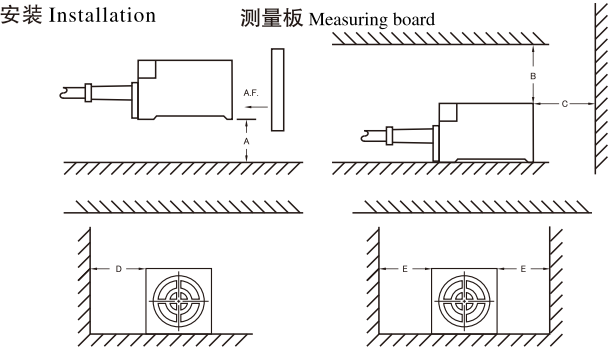
磁式传感器不受安装条件的影响，只要周围的材料不被磁化。

Non-screen shield type proximity switch can achieve the biggest action distance (related to the diameter); but in order to avoid the influence from the metal surrounding the switch to the switch, the switch inductive head must keep a certain space with the surrounding metal. (Chart 1)

The inside special screen shielding of the screen shield type proximity switch makes the magnetic field of side radial decrease and the sensing distance is about 60% that of the non-screen shield type, therefore it can be flush mounted inside the metal. (Chart 2)

Magnetic type sensor doesn't affected by the installation condition, as long as the surrounding materials aren't be magnetized.

限位，角柱型及平面安装型接近开关安装要求 Spacing, Installation requirements of angular column type and surface mounted type proximity switch



具体数据请参阅各种型号的使用说明书。

For detailed data, refer to the operation instruction of various types

选型指南—按其它参数 Type Selection Guide — In terms of other technical parameters

空载电流Io

是指接近开关在没有负载时所测得的电流消耗。

工作电流IL(持续电流)

是指开关在连续工作时的最大负载电流。

瞬间电流Ik

是指当开关闭合时不会损坏接近开关短时间内出现的允许电流。

剩余电流IR

是指接近开关断开时流过负载的电流。

工作电压UB

是指工作电压的最大，最小值；在这个范围内接近开关可以保证安全工作。

电压降Ud

是指开关接通时在开关两端所测得的电压。

工作频率f

是指从衰减状态转变到无衰减状态的最大变换次数，用赫芝(Hz)来表示。

No-load current Io

It means the current consumption that is measured when the proximity switch is on no-load.

Operating current IL (Persistent current)

It means the maximum load current when the switch works continuously.

Instantaneous current Ik

It means the allowable current in a short time that doesn't ruin the switch when the switch is closed.

Residual current IR

It means the current that goes through the load when the proximity switch is disconnected.

Operating voltage UB

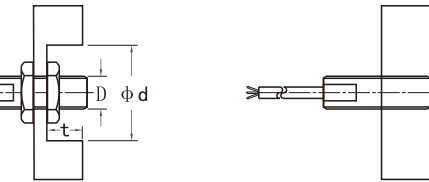
It means the maximum and minimum of the operating voltage. In this range, the proximity switch can ensure the safe operation

Voltage drop Ud

It means the voltage measured at the both ends of the switch when the switch is turned on.

Operating frequency f

It means the maximum switching times from the attenuation state to non-attenuation state, shown as Hz.



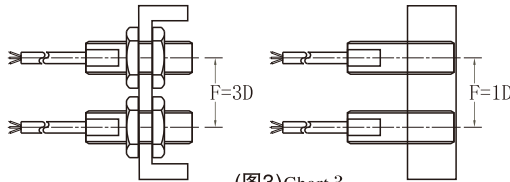
(图1)Chart 1

(图2)Chart 2

并排安装的影响(图3) Influence of parallel installation (Chart 3)

为了防止相互干扰，必须保持相互间的最小距离。

To avoid mutual interference, the minimum distance between them must be kept.



(图3)Chart 3

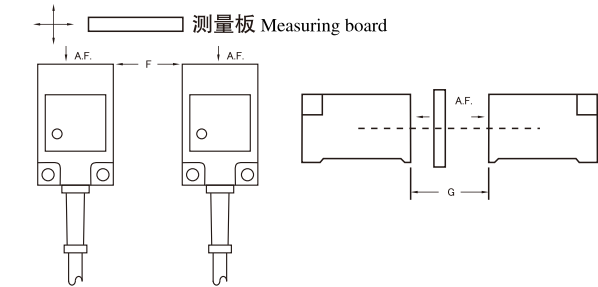
具体数据请参阅各种型号的使用说明书。

For detailed data, refer to the operation instruction of various types

并排安装的影响 Influence of parallel installation

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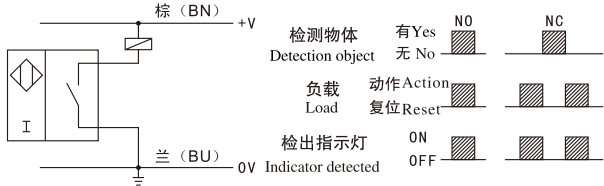
■ Pefun公司接近开关交流型，直流型 AC type and DC type Pefun proximity switch

● 直流二线制(D型)NO或NC

负载必须串联在传感器内进行工作，有极性和短路保护功能；在开路状态，存在有很小的漏电流；在闭路状态，开关元件上有一个较小的电压降。

● DC two-wire system (D type) NO or NC

The load must be series connected inside the sensor and work, owning the functions of polarity and short-circuit protection. On open-circuit state, tiny leakage current exists, while on closed-circuit state, there is a minor voltage drop on the switch elements.

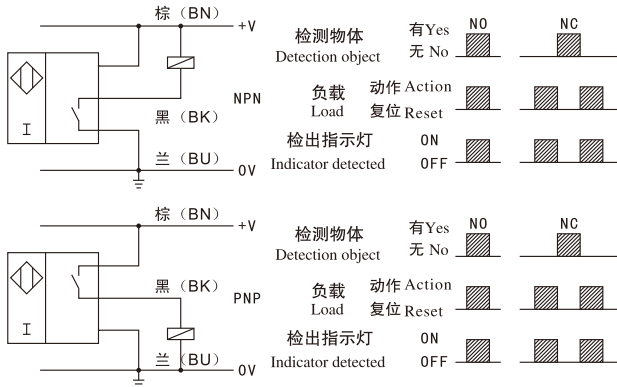


● 直流三线制(N,E,C,P,F,B型)NO或NC

这些开关的负载和供电电源分开连接；有极性，短路和过载保护功能，剩余电流可以忽略。

● DC three-wire system (N, E, C, P, F, B type) NO or NC

The load of these switches connects separately with the power supply, owning the functions of polarity, short-circuit and over-load protection. The residual current can be neglected.

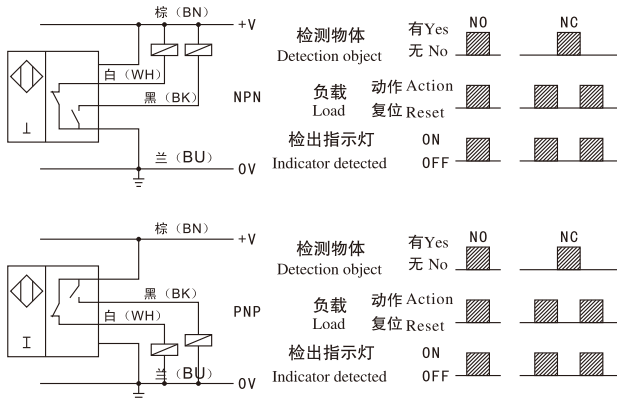


● 直流四线制(N,P型)NO加NC

这些开关可提供常开，常闭两组输出。

● DC four-wire system (N, P type) NO plus NC

The switches can provide two groups of output NO and NC

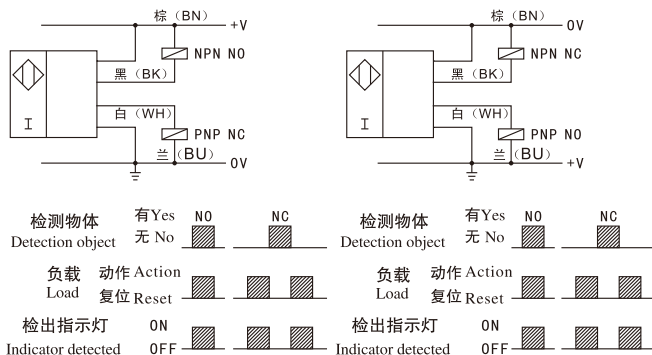


● 直流四线制(X型)

NPN,PNP,NO,NC四种输出方式可转换

● DC four-wire system (X type)

The four output modes can be converted among NPN, PNP, NO and NC

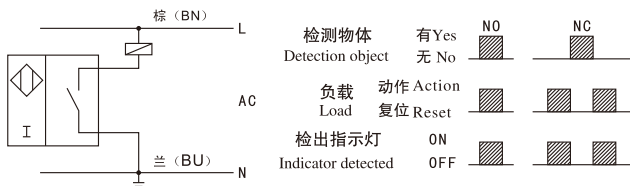


● 交流二线制(A,Y型)NO或NC

负载必须串联在传感器内进行工作，在闭路状态，开关元件上有一个较小的电压降。

● AC two-wire system (A, Y type) NO or NC

The load must be series connected inside the sensor and work, and on closed-circuit state, there is a minor voltage drop on the switch elements.

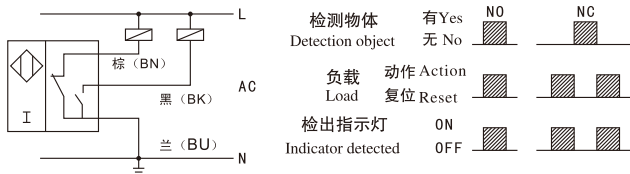


● 交流三线制(W型)NO或NC

这些开关可提供常开，常闭两组输出。

● AC three-wire system (W type) NO plus NC

The switches can provide two groups of output NO and NC

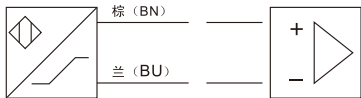


● NAMUR型接近开关，直流二线制(R型)

二线制NAMUR型接近开关，含有稳定的或变化的电流特性；由于电压和电流值被保持在很低的值，所以可以安装在危险区域(本质安全)

● NAMUR type proximity switch, DCtwo-wire system (R type)

Two-wire system NAMUR type proximity switch has steady or changeable current characteristics. Because the voltage and current are kept at a low value, it can be mounted in dangerous zones (Intrinsic safety)

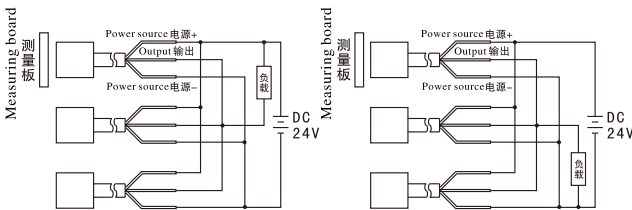


● 接近开关的并联、串联

OR连接(NPN, PNP)型不可混杂使用，并联接近开关OR连接，任意一个接近开关动作就可驱动负载。接近开关的数量取决于漏电流的和，只要它不影响负载动作，就可多个连接。

● Series and parallel connection of proximity switch

OR connection (NPN and PNP types can be used mixed) series When the proximity switch is OR connected, the action of any proximity switch can drive load. The quantity of the proximity switches depends on the sum of leakage current. More connections are available given that it doesn't affect the loading action.



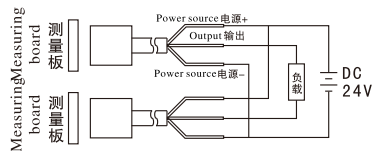
NPN输出的OR连接
OR connection of NPN output

PNP输出的OR连接
OR connection of PNP output

● 接近开关的并联、串联

AND连接(串联)NPN, PNP混杂使用

● Series and parallel connection of proximity switch AND connection (series) NPN, PNP mixed-use

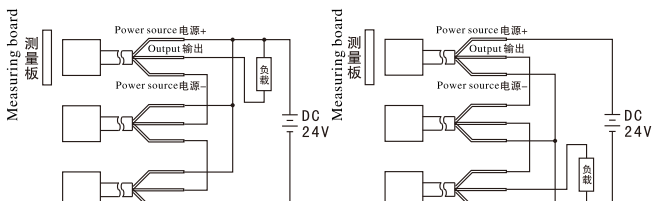


● AND连接(串联)

当接近开关AND连接，全部的接近开关动作时可驱动负载。接近开关的数量取决于其饱和电压的和，只要它不影响接近开关的电源电压，就可多个连接。接近开关的响应频率为各个接近开关初始复位的累加。

● AND connection (series)

When the proximity switch is AND connected, the action of all proximity switches can drive load. The quantity of the proximity switches depends on the sum of saturation voltage. More connections are available given that it doesn't affect the supply voltage of the proximity switch. The response frequency of the proximity switch is the accumulation of initialized reset of various proximity switch.



NPN输出的AND连接
NPN connection of AND output

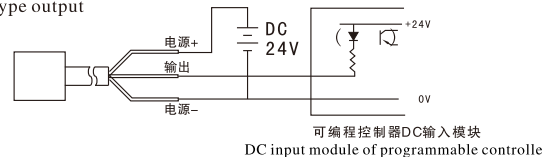
PNP输出的AND连接
PNP connection of AND output

● 接近开关与可编程控制器的连接

可与直流开关三线式NPN型输出的接近开关相连接

● Connection between proximity switch and programmable controller

Can be connected with the proximity switch of DC switch three-wire system NPN type output



接近开关使用时的注意事项 Matters Needing Attention when using Pefun proximity switch

■ 接通或断开电源时的注意事项

将接近开关与计数器，可编程控制器相联接时，其内部带有初始复位电路，不会有问题。请注意避免发生以下情况：

- 检测物体位于接近开关的检测距离附近。
- 对于直流电压型和直流开关型接近开关，在电源接通(断开)时，时间常数出现大幅上升(下降)的情况。
- 交流开关型接近开关在其电流接通(断开)时，有自激，噪音的情况下。

■ Cautions when connected or disconnected with the power supply

When connecting the proximity switch with the counter and the programmable controller, there isn't any problem because of the built-in initialized reset circuit. Please avoid the conditions mentioned below

- The detection object lies around the detection distance of the proximity switch
- For DC voltage type and DC switch type, when the power supply is turned on (turned off), time constant rises (drops) greatly
- There is self-excitation and noise when the AC switch type proximity switch is power-on (off)

■ 电容、灯负载

接近开关不能把电容、灯等突升电流较大的负荷作为与其直流连接的负载；请通过继电器连接或串接一限流电阻。限流电阻R设定的峰值电流在接近开关的负载电流内一限流电阻。

$$\frac{\text{电源电压}V}{\text{接近开关的最大负荷电流}mA} \leq R(K\Omega)$$

电阻R的容许损失(W)

$$\frac{\text{电源电压}V^2}{\leq R(K\Omega)} \times 2\text{倍以上}$$

● 请务必经过负载进行连接

■ Capacitor, light load

The proximity switch can't have the capacitor or light that has larger jumping current as the load directly connected; it's needed to be connected through a relay or series connected with a current-limiting resistance. The peak current set by current-limiting resistance R is within the load current of the proximity switch.

$$\frac{\text{Supply voltage } V}{\text{Peak load current value of proximity switch } mA} \leq R(K\Omega)$$

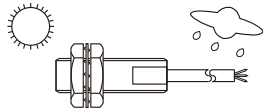
Allowable loss of resistance R (W)

$$\frac{\text{Supply voltage } V^2}{\leq R(K\Omega)} \times 2\text{ times above}$$

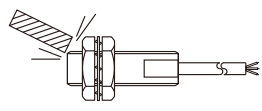
● Make sure to connect through load

■ 接近开关安装注意事项 Installation notice of proximity switch

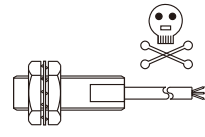
- 请不要在露天环境中使用，必要时请使用保护罩。
- Don't use it in the open air, and use a protective cover, if necessary.



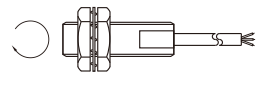
- 请不要用硬的物体撞击检测面，必要时请使用保护罩。
- Don't knock the detection surface with hard objects and use a protective cover, if necessary.



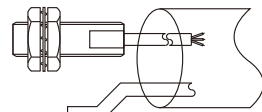
- 请不要在有腐蚀性物品的环境中使用。
- Don't use it in the environment with corrosive objects.



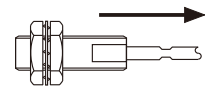
- 请不要用大力量紧固，紧固时，请使用弹垫紧固。
- Don't fasten it with a big force, but fasten it with spring washer



- 接近开关的配线应单独配金属软管，请不要与电力线，动力线一起在同一金属软管内。
- The proximity switch must be equipped individually with metal flexible pipe, and don't make it with the electric line and power line in the same metal flexible pipe



- 请不要用大力量拉伸接近开关的电源线。
- Don't stretch the power line of the proximity switch with a big force.



接近、光电开关的应用实例 Application Examples of Pefun Proximity Switch and Photoelectric Switch

1、厚纸箱检测 Thick carton detection 一侧不能装传感器时，采用漫反射式光电开关。Use photoelectric switch with diffuse reflection when the sensor can't be mounted on one side 内置电源型光电开关 Built-in power type photoelectric switch 漫反射式光电开关 Photoelectric switch with diffuse reflection	2、起重机的报警装置 Alarm device of the crane 起重机的方向判断和进入危险区的检测。The direction judgment of the crane and the detection of the approach into the dangerous zone 槽型光电开关 Slot type photoelectric switch 槽型光电开关 Slot type photoelectric switch	3、啤酒瓶的有无标签检测 Tag detection of the beer bottle 用反射式光电开关检测啤酒瓶，用对射式光电开关检测有无标签。Check the beer bottle with the reflection type photoelectric switch, and check whether there is a tag with the correlation type photoelectric switch. 反射式光电开关，对射式光电开关 Reflection type photoelectric switch, correlation type photoelectric switch	4、镜面的稳定检测 Steady detection of mirror surface object 按MSR功能，镜面体也能毫无误动作地稳定检测。It's available for mirror surface object to undertake steady detection without any misoperation in terms of function MSR. 反射式光电开关 Reflection type photoelectric switch	5、玻璃管内的水位检测 Water level detection inside glass tube 把投光器和受光器稍微错开角度安装，仅投光器上透镜是关键。水位下降时则变成遮光状态，可实现精度为1mm的水位检测。Mount the light projector and the light receptor at a slightly staggered angle and the lens on the light projector is the key point. The water level drops, it turns into lightproof state, and the precision of water level detection is up to 1mm. 对射式光纤传感器 Correlation type optical fiber sensor
6、气密检测 Gas tight detection 衬底为半透明时，用对射式可检测。When the substrate is translucent, undertake detection with correlation type. 光纤对射式光电开关 Optical fiber correlation type photoelectric switch	7、检志检测 Mark detection 标志传感器 Mark sensor	8、斜面检测 Inclination detection 漫反射式光电开关 Photoelectric switch with diffuse reflection	9、机器人工作区安全检测 Safety detection in robot work area 安全光幕传感器 Safety optical veiling sensor	10、机加工中心的各种位置检测 Various position detection in machining centre 圆柱型接近开关 Cylindrical type proximity switch
11、动作时凸轮检出 Action sequence cam detection 扁平型接近开关 Flat type proximity switch	12、脉冲发生器 Pulser 槽型接近开关 Slot type proximity switch	13、瓶盖检测 Bottle cap detection 温水洗净 Clean with warm water 多温环境 Multi-temperature environment 防水型接近开关 Water-proof type proximity switch	14、磨床挡块检测 Grinder stop detection 防水型接近开关 Water-proof type proximity switch	15、检测纸包装内有无牛奶 Detect whether there is milk inside the paper packet 电容式接近开关 Capacitive type proximity switch

■ 光电传感器型号命名及含义 Type Naming & Specification of Proximity Switch

E3 □ - □ □ □ □ □ □ □ □ □ □
<1> <2> <3> <4> <5> <6> <7> <8> <9> <10> <11>

1、基本形式：E3:光电开关

2、结构形式：例：F;S;R;JK;X

3、检出方式：□：透过型；R：回归反射型；D：扩散反射型；
L：限定反射型；V：色标检测；G：槽型

4、距离单位：□：M；S：CM；M：MM

5、检出距离：用数字表示

6、投受光器：□：投受光器一体；L：投光器；D：受光器

7、光学构成：□：固定式；X：可变式

8、光源种类：□：红外不可见光；R：赤色可见光；G：绿色可见光

9、输出方式：C：NPN;B:PNP;E:NPN负载内藏；F：PNP负载内藏；
K：交流继电器；M：交直流继电器；Y：交流两线

10、输出状态：1：NO；2：NC；4：NO+NC

11、光轴方向：□：前端面

1、basic type:E3 photo electric switch

2、structure type: Example: SF;R;JK;X

3、detection method: □：permeate type; R:feedback reflection type; D:diffuse reflection type;
L:limit reflection type; V:color code detetion type; G:Slot type

4、Distance Unit: □：M；S：CM；M：MM

5、Detection distance: indicated by numbers

6、Projector&photoceptor: □：light projector and photoceptor integrated ;
L: light projector D: photoceptor

7、optical composition: □：Fixed type; X: adjustable type

8、light source category:Infrared invisible light; R:Red visible light; G:Green visible light

9、Output mode: C: NPN; B:PNP: E:NPN inside loading;F: PNP inside loading;
K:AC relay; M: DC relay; Y:AC two wires

10、Output state: 1:NO;2NC: 4: NO+NC

11、Direction of optical axis: □：Front



光电开关的工作原理

发射器对准目标不间断发射光束，接收器把接收到的光能量转换为电流传输给后面的检测线路，它能滤出有效信号和应用该信号。

Operation principle of photoelectric switch

The transmitter aims at the target and generates light beam, and the receptor turns the light energy received into current and transmits it to the detection circuit backwards. It can filter out an effective signal and use it.

光电开关的技术术语

距离滞后

是指测量板靠近光电开关产生的动作距离和复位距离之差；滞后距离用开关的距离的百分比来表示。

亮通/暗通

Technical terms of photoelectric switch

Distance delay

It means the distance difference between the action distance and the reset distance produced when the measuring board approaches the photoelectric switch; the delay distance is shown as percent number of switch distance.

Light on / Dark on

类型 Type	图例 Illustration	暗通 Dark on	亮通 Light on
对射型光电开关 Correlation type photoelectric switch			
反射板型光电开关 Reflecting board type photoelectric switch			
漫反射型光电开关 Diffuse reflection type photoelectric switch			

指向角

对射型、反射型能保证光电开关能稳定工作的角度范围。

响应时间

指从光输入的上升、下降沿与相应的控制输出上升、下降沿距离间隔为动作或复位的迟后时间。(动作时间=复位时间)

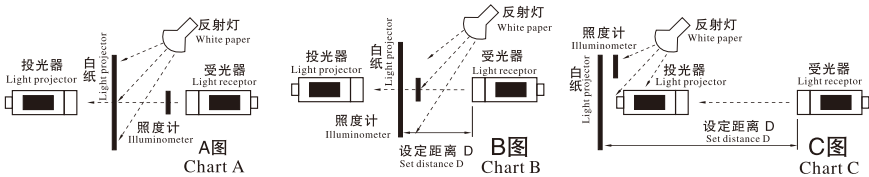
Angle of spread

Correlation type and reflection type can ensure the angle range for photoelectric switch to work steadily.

Response time

It means the delay time when the distance difference is action distance or reset distance between the rise and fall edge of the light input, and the rise and fall edge of the relevant control output. (Action time = reset time).

工作环境照度 Illumination level of operational environment



(A图)当外部干扰受光器时给予影响，故将(A图)的测定作为外部干扰光照度的基准；在(B图)和(C图)，根据设定距离D及白板纸反射率等，对受光器的影响程度产生变化，基准变的不明确。

(Chart A) When surrounding environment interferes in the light receptor, it works, therefore, make the determination of Chart A as the criterion of the surrounding environment interference to the illumination level; in Chart B and Chart C, the interference degree of the light receptor changes in terms of the set distance D and white paper reflection ratio, therefore, the criterion becomes uncertain.

镜面抑制(MSR)功能

回归反射型光电开关利用内装的偏光滤光器和回归反射的特点，只接收来自回归反射板光束的功能。通过投光部偏光滤光器的光束变为横向。

向射到回归反射板三角锥上的光束由横向变为纵向。

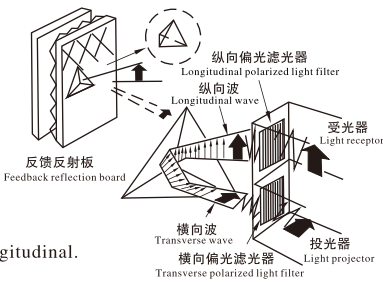
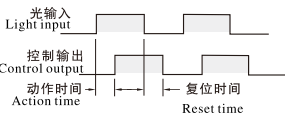
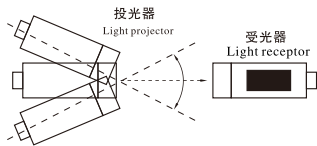
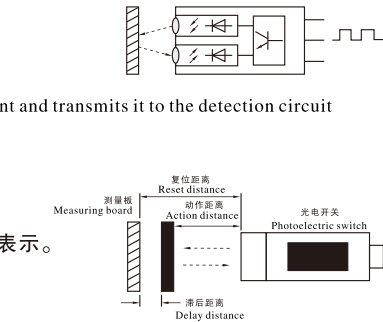
其反射光通过受光部的偏光滤光器到达受光元件。

Mirror surface rejection function (MSR)

Due to the built-in polarized light filter and the property of retro-reflection, the retro-reflection type photoelectric switch only accepts the light beam from the retro-reflection board. Through the light projection part, the light beam of polarized light filter becomes transverse.

The light beam reflected to the standard pyrometric cone of the retro-reflection board becomes from transverse to longitudinal.

The reflected light reaches the light receiving elements through the polarized light filter of the light receiving part.



反射板的盲区

反射在反射的过程中，有一段区域是反射板不能识别的区域，这段区域就是反射板的盲区。

恒定光

是指辐射功率基本上是固定的光。

检测范围

是指光电开关与物体之间的最大可用距离。检测范围与发射光的强度、测量区域的环境状况、反射物体的情况有关。

Dead zone of reflection board

During the reflection process, there is a part of area that the reflection board can't identify. This part of area is exactly the dead zone of reflection board.

Constant light

It means the light whose radiation power is basically constant.

Detection range

It means the maximum available distance between the photoelectric switch and the object. Detection range is concerned with the reflection light intensity, the environment state of measuring area and the reflection object condition.

红外线(IR或IRED)

是指一种辐射波长很长的光($\lambda=780\text{nm}$ 到 1mm)

Infrared ray (IR or IRED)

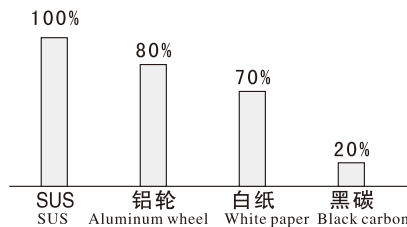
It's a kind of light whose radiation wavelength is very long. ($\lambda=780\text{nm}$ to 1mm)

反射性能

是指目标的特性，它与目标表面构造和颜色、大小有着依赖关系；还与入射光是优或劣，定向的或漫反射的有；无反射的部分是全吸收或者透射；反射型光电开关采用通用材料可以得到较好的反射距离。

Reflection performance

It's the target's characteristic. It has dependency relationship with the surface structure, color and size of the target, in addition, whether the incident light is good or bad, whether it is directed or diffuse reflected and whether the non-reflection part is totally absorbed or transmitted do matter. The reflection type photoelectric switch that adopts general material can achieve better reflecting distance.



调节器

通过内置式电位器，在最小照度的情况下，使接收器能产生开关输出；由此可以在有效作用距离内将开关距离调节到最佳程度。

开关频率

是指光电开关可分辨的断续地发射光束的每一次时间隔的最高速度，开关频率用赫芝(Hz)来表示。

Adjuster

Through the built-in potential meter and under the circumstance of the minimum illumination level, it makes the receptor produce switch output, therefore, the switch distance can be adjusted to the best state inside the range of the effective distance.

Switching frequency

It means the maximum frequency of each interval for transmitting light beam intermittently that the photoelectric switch can distinguish. It's shown as Hz.

传感器光电开关的类型 Types of Sensor Photoelectric Switch

对射型光电开关

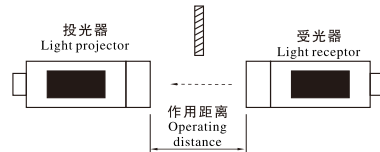
对射型光电开关由投光器、受光电组成，结构上两者是相互分离的。

辨别不透明的反光物体。

有效距离大,因为光束跨越感应距离的时间仅一次。

不易受干扰。

装置的消费高，两个单元都必须敷设电缆。



Correlation type photoelectric switch

Correlation type photoelectric switch is made up of light projector and light receptor, and the both are respectively separated in structure.

Distinguish the opaque reflective object.

Large effective distance, for the light beam crosses the sensing distance only once.

Not vulnerable to be interfered.

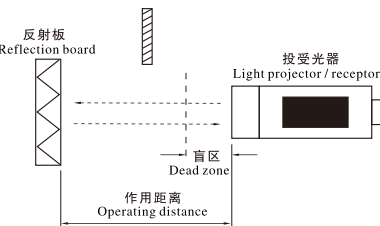
The equipment has high consumption, so cables must be laid out on the two units.

反射板型光电开关

反射板型光电开关由投光器和受光器构成的情况是一种标准配置。从发送器来的光束，在对面的反射镜被反射，既返回受光器。光的通过时间是两倍的信号持续时间；当光束被中断时产生一个开关变化。

Reflection board type photoelectric switch

Reflection board type photoelectric switch is made up of light projector and light receptor, which is one of standard configurations. The light beam from the projector is reflected by the opposite mirror, and then goes back to the light receptor. The transit time is twice the signal's duration time; a switch change comes into being when the light beam breaks.



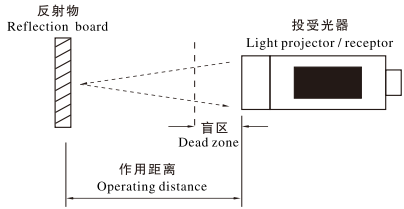


- 辨别不透明的反光物体。
- 透明玻璃识别标志可以借助于特殊的传感器。
- 当带有偏振滤光镜的传感器使用时，反射目标成为可靠的识别(可参见M S R功能)
- 借助反射镜部件，形成高的有效距离范围。
- 不易受干扰。

- Distinguish the opaque reflective object
- Transparent glass identification mark can be made of special sensor
- When the sensor with polaroid filter works, the reflective target becomes a reliable identification (See MSR function)
- High effective distance range is available with the help of reflective mirror parts
- Not vulnerable to be interfered

漫反射型光电开关

- 漫反射型光电开关由投光器和受光器构成的情况是一种标准配置。从发送器来的光束时，目标产品漫反射；当有足够的组合光返回受光器时，开关状态发生变化。
- 有效作用距离是由目标的反射能力决定的，是由表面性质和颜色决定的。带有灵敏度调节器的变化能力可起到补偿作用。
- 较小的装配开支，光传感器由单个元件组成时，通常可以达到粗定位。
- 采用背景抑制功能调节测量距离。
- 对目标上的灰尘敏感和对目标变化了的反射性能敏感



Diffuse reflection type photoelectric switch

- Diffuse reflection type photoelectric switch is made up of light projector and light receptor, which is one of standard configurations. When the light beam comes from the projector, the target creates diffuse reflection; when the re is enough combination light back to the light receptor, the switching state will change.
- Effective operating distance depends on the reflective capacity of the target, as well as the surface property and color. The change capacity with sensitivity adjuster can assume compensation action.
- The equipment has lower consumption. When the optical sensor is made up of a single element, rough location can usually be achieved.
- Adopts the function of background rejection to regulate the measuring distance.
- Sensitive to the dust on the target and sensitive to the changed reflective performance of the target.

光纤传感器

- 检测微小物体(最小为0.5mm)
- 用高极合金钢作为外包装，可以在高温环境中使用。
- 对有约束的安装状况的适宜的。

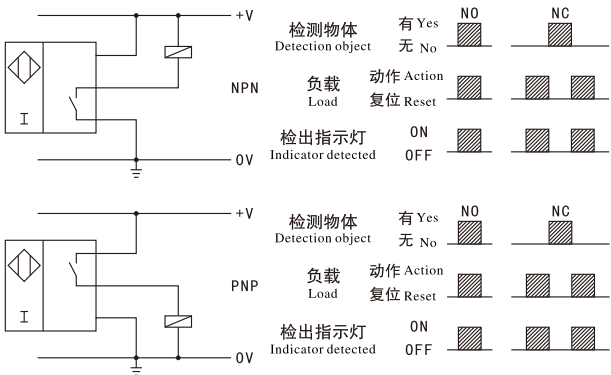
Optical fiber sensor

- Detect micro-objects (Minimum 0.5mm).
- Use high-class alloy steel as external packing, which can work in the high temperature environment.
- Suitable to the installation condition which has restriction.

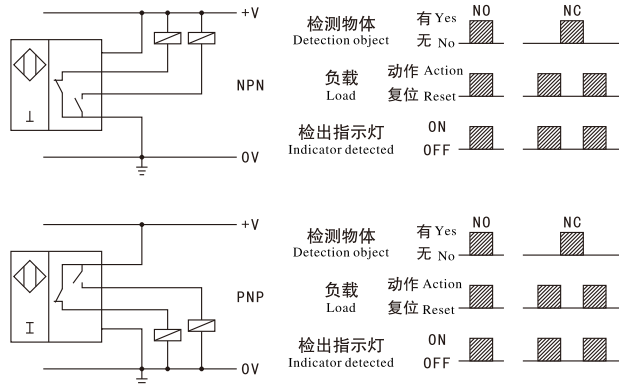
光电开关的电气特性和输出型式 Electrical Characteristics & Output Form of Pefun Photoelectric Switch

Pefun公司光电开关交流型，直流型 AC type and DC type Pefun photoelectric switch

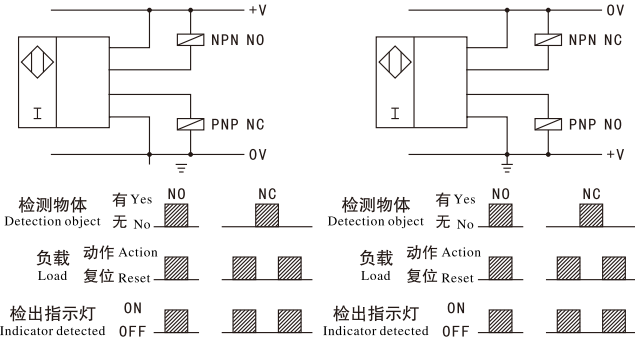
- 直流三线制(N,E,C,P,F,B型)NO或NC这些开关的负载和供电电源分开连接；有极性，短路和过载保护功能，剩余电流可以忽略。
- DC three-wire system (N, E, C, P, F, B type) NO or NC
The load of these switches connects separately with the power supply, owning the functions of polarity, short-circuit and over-load protection. The residual current can be neglected.



- 直流四线制(N,P型)NO加NC
这些开关可提供常开，常闭两组输出。
- DC four-wire system (N, P type) NO plus NC
The switches can provide two groups of output NO and NC.

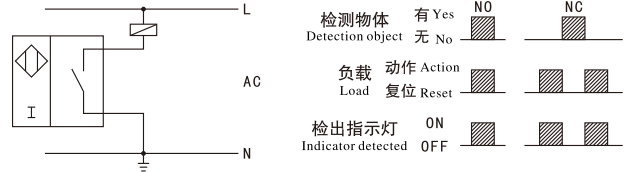


- 直流四线制(X型) DC four-wire system (X type)
NPN,PNP,NO,NC四合种输出方式可转换
The four output modes can be converted among NPN, PNP, NO and NC

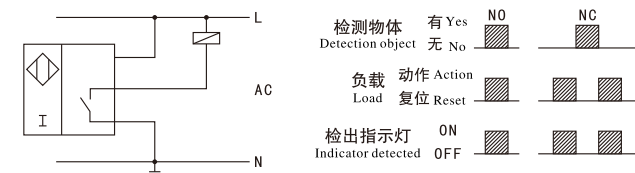


- 交流二线制(A,Y型)NO或NC AC two-wire system (A, Y type) NO or NC
负载必须串联在传感器内进行工作在开路状态，在闭路状态，开关元件上有一个较小的电压降

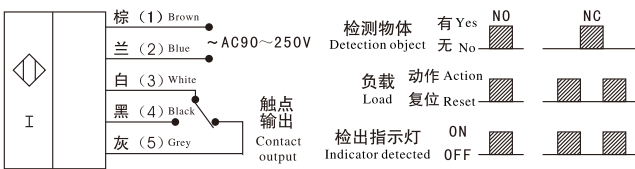
The load must be series connected inside the sensor and work, and on closed-circuit state, there is a minor voltage drop on the switch elements.



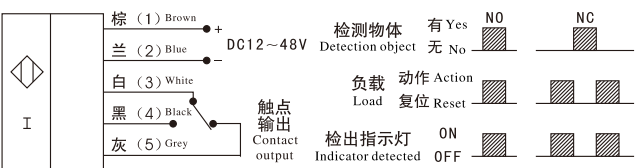
- 交流三线制(W型)NO或NC AC three-wire system (W type) NO plus NC



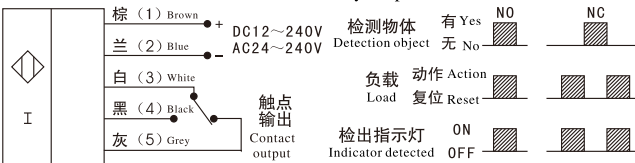
- 交流五线制(J型)继电器输出 AC five-wire system (J type) relay output



- 直流五线制(D型)继电器输出 DC five-wire system (D type) relay output



- 交直流五线制(M型)继电器输出 AC / DC five-wire system (M type) relay output



光电开关的并联、串联(请参照接近开关的参数)

Series and parallel connection of photoelectric switch (See the parameters of proximity switch)

光电开关的注意事项

Matters Needing Attention when using photoelectric switch

防止相互干扰的方法

- 光电开关接近设置时，另一个开关的光入射时造成的不稳定动作，叫做相互干扰；
- 投光器、受光器相互交叉安装；
- 反射式并列使用时，相互间隔须维持设定距离在检测距离的1.4倍以上；
- 对射式并列使用时，相互间隔须维持设定距离在检测距离的0.4倍以上。

其它注意事项

- 光电开关的配线应单独配金属软管，请不要与电力线，动作线一起在同一金属软管内；
- 电源电压请在电源电压范围内使用。

下列安装场合使用时会造成误动作，请加以注意

- 灰尘较多的场合；
- 腐蚀性气体较多的场合；
- 水、油、药济直接溅散的场所；
- 太阳光等强光直接照射的场合；
- 使用时的环境温湿度应在额定范围内。

关于维护检修

- 检测物体及光电开关的安装位置有无偏移，松动；
- 配线、连接部位有无松动，接触不良，断线；
- 有无附粘灰尘等堆积物；
- 使用温度条件，周围环境条件有无异常；
- 检测距离有无异常。

Ways to avoid mutual interference

- When the photoelectric switch approaches to the equipment, the light from another switch emits, causing unsteady action, which is called mutual interference;
- The light projector and the light receptor are cross-installed mutually;
- When the reflection type is used together, the distance between them must be kept, and the set distance is 1.4 times of detection distance;
- When the correlation type is used together, the distance between them must be kept, and the set distance is 0.4 times of detection distance.

Other matters needing attention

- The Photoelectric switch must be equipped individually with metal flexible pipe, and don't make it with the electric line and power line in the same metal flexible pipe;
- The supply voltage must inside the supply voltage range.

Misoperation may be caused in the following installation locations and pay attention

- Where there is more dust;
- Where there is more corrosive gas;
- Where water, oil and drugs are sprayed straightly;
- Where intense light such as sun light shines directly;
- When it's during the use, the ambient temperature and humidity must be inside the rated range.

About maintenance and repair

- Check whether there is any movement or looseness about the installation sites of the object and photoelectric switch;
- Check whether there is any looseness, bad contact or disconnection about the equipped line and connecting parts;
- Check whether there is any deposit adhered, such as dust;
- Check whether the operating temperature condition and ambient environment condition are abnormal;
- Check whether the detection distance is abnormal.



尺寸 Dimension: $\Phi 4 \times 30$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ4A3-1-Z/BX
NPN NC	LJ4A3-1-Z/AX
PNP NO	LJ4A3-1-Z/BY
PNP NC	LJ4A3-1-Z/AY
DC NO	LJ4A3-1-Z/EZ
DC NC	LJ4A3-1-Z/DZ
检测距离 Detection distance	1mm

尺寸 Dimension: $M5 \times 1 \times 30$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ5A3-1-Z/BX
NPN NC	LJ5A3-1-Z/AX
PNP NO	LJ5A3-1-Z/BY
PNP NC	LJ5A3-1-Z/AY
DC NO	LJ5A3-1-Z/EZ
DC NC	LJ5A3-1-Z/DZ
检测距离 Detection distance	1mm

尺寸 Dimension: $M8 \times 1 \times 40$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ8A3-1.5-Z/BX
NPN NC	LJ8A3-1.5-Z/AX
PNP NO	LJ8A3-1.5-Z/BY
PNP NC	LJ8A3-1.5-Z/AY
DC NO	LJ8A3-1.5-Z/EX
DC NC	LJ8A3-1.5-Z/DX
AC NO	LJ8A3-1.5-J/EZ
AC NC	LJ8A3-1.5-J/DZ
检测距离 Detection distance	1.5mm

尺寸 Dimension: $M8 \times 1 \times 40$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	LJ8A3-2-Z/BX
NPN NC	LJ8A3-2-Z/AX
PNP NO	LJ8A3-2-Z/BY
PNP NC	LJ8A3-2-Z/AY
DC NO	LJ8A3-2-Z/EX
DC NC	LJ8A3-2-Z/DX
AC NO	LJ8A3-2-J/EZ
AC NC	LJ8A3-2-J/DZ
检测距离 Detection distance	2mm

尺寸 Dimension: $M12 \times 1 \times 55$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ12A3-2-Z/BX
NPN NC	LJ12A3-2-Z/AX
PNP NO	LJ12A3-2-Z/BY
PNP NC	LJ12A3-2-Z/AY
DC NO	LJ12A3-2-Z/EX
DC NC	LJ12A3-2-Z/DX
AC NO	LJ12A3-2-J/EZ
AC NC	LJ12A3-2-J/DZ
检测距离 Detection distance	2mm

尺寸 Dimension: $M12 \times 1 \times 55$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	LJ12A3-4-Z/BX
NPN NC	LJ12A3-4-Z/AX
PNP NO	LJ12A3-4-Z/BY
PNP NC	LJ12A3-4-Z/AY
DC NO	LJ12A3-4-Z/EX
DC NC	LJ12A3-4-Z/DX
AC NO	LJ12A3-4-J/EZ
AC NC	LJ12A3-4-J/DZ
检测距离 Detection distance	4mm

尺寸 Dimension: $M18 \times 1 \times 60$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ18A3-5-Z/BX
NPN NC	LJ18A3-5-Z/AX
PNP NO	LJ18A3-5-Z/BY
PNP NC	LJ18A3-5-Z/AY
DC NO	LJ18A3-5-Z/EX
DC NC	LJ18A3-5-Z/DX
AC NO	LJ18A3-5-J/EZ
AC NC	LJ18A3-5-J/DZ
检测距离 Detection distance	5mm

尺寸 Dimension: $M18 \times 1 \times 60$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	LJ18A3-8-Z/BX
NPN NC	LJ18A3-8-Z/AX
PNP NO	LJ18A3-8-Z/BY
PNP NC	LJ18A3-8-Z/AY
DC NO	LJ18A3-8-Z/EX
DC NC	LJ18A3-8-Z/DX
AC NO	LJ18A3-8-J/EZ
AC NC	LJ18A3-8-J/DZ
检测距离 Detection distance	8mm

尺寸 Dimension: $M30 \times 1.5 \times 60$	
 屏蔽式 Screen shield	
规格specification	型号 Model
NPN NO	LJ30A3-10-Z/BX
NPN NC	LJ30A3-10-Z/AX
PNP NO	LJ30A3-10-Z/BY
PNP NC	LJ30A3-10-Z/AY
DC NO	LJ30A3-10-Z/EX
DC NC	LJ30A3-10-Z/DX
AC NO	LJ30A3-10-J/EZ
AC NC	LJ30A3-10-J/DZ
检测距离 Detection distance	10mm

尺寸 Dimension: $M30 \times 1.5 \times 60$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	LJ30A3-15-Z/BX
NPN NC	LJ30A3-15-Z/AX
PNP NO	LJ30A3-15-Z/BY
PNP NC	LJ30A3-15-Z/AY
DC NO	LJ30A3-15-Z/EX
DC NC	LJ30A3-15-Z/DX
AC NO	LJ30A3-15-J/EZ
AC NC	LJ30A3-15-J/DZ
检测距离 Detection distance	15mm

尺寸 Dimension: $17 \times 17 \times 36$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	SN04-N
NPN NC	SN04-N2
PNP NO	SN04-P
PNP NC	SN04-P2
DC NO	SN04-D1
DC NC	SN04-D2
AC NO	SN04-A1
AC NC	SN04-A2
检测距离 Detection distance	5mm

尺寸 Dimension: $17 \times 17 \times 28$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-Q5MC1
NPN NC	TL-Q5MC2
PNP NO	TL-Q5MB1
PNP NC	TL-Q5MB2
DC NO	TL-Q5MD1
DC NC	TL-Q5MD2
AC NO	TL-Q5MA1
AC NC	TL-Q5MA2
检测距离 Detection distance	5mm

尺寸 Dimension: $25 \times 25 \times 38.5$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-N5ME1
NPN NC	TL-N5ME2
PNP NO	TL-N5MF1
PNP NC	TL-N5MF2
DC NO	TL-N5MD1
DC NC	TL-N5MD2
AC NO	TL-N5MA1
AC NC	TL-N5MA2
检测距离 Detection distance	5mm

尺寸 Dimension: $30 \times 30 \times 52.5$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-N10ME1
NPN NC	TL-N10ME2
PNP NO	TL-N10MF1
PNP NC	TL-N10MF2
DC NO	TL-N10MD1
DC NC	TL-N10MD2
AC NO	TL-N10MA1
AC NC	TL-N10MA2
检测距离 Detection distance	10mm

尺寸 Dimension: $40 \times 40 \times 54$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-N20ME1
NPN NC	TL-N20ME2
PNP NO	TL-N20MF1
PNP NC	TL-N20MF2
DC NO	TL-N20MD1
DC NC	TL-N20MD2
AC NO	TL-N20MA1
AC NC	TL-N20MA2
检测距离 Detection distance	20mm

尺寸 Dimension: $17 \times 17 \times 28.5$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	PL-05N
NPN NC	PL-05N2
PNP NO	PL-05P
PNP NC	PL-05P2
DC NO	PL-05D1
DC NC	PL-05D2
AC NO	PL-05A1
AC NC	PL-05A2
检测距离 Detection distance	5mm

尺寸 Dimension: $10 \times 18 \times 30$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-W5MC1
NPN NC	TL-W5MC2
PNP NO	TL-W5MB1
PNP NC	TL-W5MB2
DC NO	TL-W5MD1
DC NC	TL-W5MD2
AC NO	TL-W5MA1
AC NC	TL-W5MA2
检测距离 Detection distance	5mm

尺寸 Dimension: $5.5 \times 10 \times 27$	
 非屏蔽式 Non-screen shield	
规格specification	型号 Model
NPN NO	TL-W2MC1
NPN NC	TL-W2MC2
PNP NO	TL-W2MB1
PNP NC	TL-W2MB2
DC NO	
DC NC	
AC NO	
AC NC	
检测距离 Detection distance	2mm

尺寸 Dimension: M18*1*71.5



非屏蔽式
Non-screen shield

规格specification	型号 Model
NPN / PNP NO	LJC18A3-8-Z/BX
NPN / PNP NC	LJC18A3-8-Z/AX
PNP NO	
PNP NC	
DC NO	
DC NC	
AC NO	LJC18A3-8-J/EZ
AC NC	LJC18A3-8-J/DZ
检测距离 Detection distance	8mm

尺寸 Dimension: 40*40*118



非屏蔽式
Non-screen shield

规格specification	型号 Model
NPN NO	NBB20-L2-E0-V1
NPN NC	NBB20-L2-E1-V1
PNP NO	NBB20-L2-E2-V1
PNP NC	NBB20-L2-E3-V1
DC NO	
DC NC	
AC NO	
AC NC	
检测距离 Detection distance	20mm

尺寸 Dimension: 40*40*118



非屏蔽式
Non-screen shield

规格specification	型号 Model
NPN NO+NC	LT37-3020NC
NPN NC	
PNP NO+NC	LT37-3020PC
PNP NC	
DC NO	LT37-3020A
DC NC	LT37-3020B
AC NO	LT37-2020A
AC NC	LT37-2020B
检测距离 Detection distance	20mm

尺寸 Dimension: M12*1*40



屏蔽式
Screen shield

规格specification	型号 Model
NPN NO	MM12-3010NA
检测距离 Detection distance	10mm

尺寸 Dimension: M18*1*60



非屏蔽式
Non-screen shield

规格specification	型号 Model
电压/电流 Voltage/Current	XM18-3008PMI
电压Voltage	DC0-10V
电流Current	0-20mA
检测距离 Detection distance	0-8mm

尺寸 Dimension: 18*50*50



漫反射
Diffuse reflection

规格specification	型号 Model
AC继电器Relay	E3JK-DS30A
DC继电器Relay	E3JK-DS30D
检测距离 Detection distance	30cm
AC继电器Relay	E3JK-DS100A
DC继电器Relay	E3JK-DS100D
检测距离 Detection distance	100cm
AC/DC继电器Relay	E3JK-DS30M1
AC/DC继电器Relay	E3JK-DS30M2
检测距离 Detection distance	30cm

尺寸 Dimension: 18*50*50



回归反射
Retroreflex

规格specification	型号 Model
AC继电器Relay	E3JK-R4A
DC继电器Relay	E3JK-R4D
AC/DC继电器Relay	E3JK-R4M1
AC/DC继电器Relay	E3JK-R4M2
检测距离 Detection distance	4m

尺寸 Dimension: 18*50*50



对射
Correlation

规格specification	型号 Model
AC继电器Relay	E3JK-5A
DC继电器Relay	E3JK-5D
检测距离 Detection distance	5m
AC继电器Relay	E3JK-20A
DC继电器Relay	E3JK-20D
检测距离 Detection distance	20m
AC/DC继电器Relay	E3JK-5M1
AC/DC继电器Relay	E3JK-5M2
检测距离 Detection distance	5m

尺寸 Dimension: M18*1*52



漫反射
Diffuse reflection

规格specification	型号 Model
NPN NO+NC	E3F-DS10C4
NPN NC	
PNP NO+NC	E3F-DS10B4
PNP NC	
DC NO	
DC NC	
AC NO	E3F-DS10A1
AC NC	E3F-DS10A2
检测距离 Detection distance	10cm

尺寸 Dimension: M18*1*52



漫反射
Diffuse reflection

规格specification	型号 Model
NPN NO+NC	E3F-DS30C4
NPN NC	
PNP NO+NC	E3F-DS30B4
PNP NC	
DC NO	
DC NC	
AC NO	E3F-DS30A1
AC NC	E3F-DS30A2
检测距离 Detection distance	30cm

尺寸 Dimension: M18*1*52



漫反射
Diffuse reflection

规格specification	型号 Model
NPN NO+NC	HA-E3F-DS80C4
NPN NC	
PNP NO+NC	HA-E3F-DS80B4
PNP NC	
DC NO	
DC NC	
AC NO	HA-E3F-DS80A1
AC NC	HA-E3F-DS80A2
检测距离 Detection distance	80cm

尺寸 Dimension: M18*1*52



回归反射
Retroreflex

规格specification	型号 Model
NPN NO+NC	E3F-R2C4
NPN NC	
PNP NO+NC	E3F-R2B4
PNP NC	
DC NO	
DC NC	
AC NO	E3F-R2A1
AC NC	E3F-R2A2
检测距离 Detection distance	2m

尺寸 Dimension: M18*1*52



对射
Correlation

规格specification	型号 Model
NPN NO+NC	E3F-5C4
NPN NC	
PNP NO+NC	E3F-5B4
PNP NC	
DC NO	
DC NC	
AC NO	E3F-5A1
AC NC	E3F-5A2
检测距离 Detection distance	5m

尺寸 Dimension: M18*1*52



对射
Correlation

规格specification	型号 Model
NPN NO+NC	E3F-20C4
NPN NC	
PNP NO+NC	E3F-20B4
PNP NC	
DC NO	
DC NC	
AC NO	E3F-20A1
AC NC	E3F-20A2
检测距离 Detection distance	20m

尺寸 Dimension: M18*1*60



漫反射
Diffuse reflection

规格specification	型号 Model
NPN NO+NC	CDD-11N
PNP NO+NC	CDD-11P
检测距离 Detection distance	10cm
NPN NO+NC	CDD-40N
PNP NO+NC	CDD-40P
检测距离 Detection distance	40cm
NPN NO+NC	CDD-100N
PNP NO+NC	CDD-100P
检测距离 Detection distance	100cm

尺寸 Dimension: 10.8*20*31



漫反射
Diffuse reflection

规格specification	型号 Model
NPN	E3Z-D61
PNP	E3Z-D81
检测距离 Detection distance	100mm
NPN	E3Z-D62
PNP	E3Z-D82
检测距离 Detection distance	1m
NPN	E3Z-L61
PNP	E3Z-L81
检测距离 Detection distance	70cm

尺寸 Dimension: 10.8*20*31



回归反射
Retroreflex

规格specification	型号 Model
NPN	E3Z-R61
PNP	E3Z-R81
检测距离 Detection distance	2m

尺寸 Dimension: 10.8*20*31



对射
Correlation

规格specification	型号 Model
NPN	E3Z-T61
PNP	E3Z-T81
检测距离 Detection distance	15m
NPN	E3Z-T61A
PNP	E3Z-T81A
	10m
NPN	E3Z-T62
PNP	E3Z-T82
检测距离 Detection distance	5m

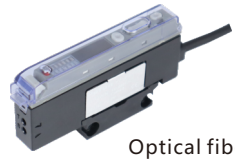
尺寸 Dimension: 16*25*55	
	
槽型 Slot type	
规格specification	型号 Model
NPN / PNP NO	SU-07X
NPN / PNP NC	SU-07XB
槽宽距离 Groove width distance	7mm

尺寸 Dimension: 20*55*72	
	
槽型 Slot type	
规格specification	型号 Model
NPN / PNP NO	E3S-GS30C1
NPN / PNP NC	E3S-GS30C2
槽宽距离 Groove width distance	30mm

尺寸 Dimension: 6*13*26	
	
微槽型光电开关 Micro-slot type	
规格specification	型号 Model
NPN NO	EE-672WR
NPN NC	
PNP NO	
PNP NC	
DC NO	
DC NC	
AC NO	
AC NC	
槽宽距离 Groove width distance	5mm

尺寸 Dimension: 22*63*89	
	
色标 Color sensor	
规格specification	型号 Model
NPN NO白光 White light	KS-C2W
NPN NO红光 Red light	KS-C2R
NPN NO绿光 Green light	KS-C2G
NPN NO蓝光 Blue light	KS-C2B
检测距离 Detection distance	10mm

尺寸 Dimension: 10.8*20*31	
	
背景抑制光电开关 Background suppression	
规格specification	型号 Model
NPN NO	E3Z-LS61
NPN NC	
PNP NO	
PNP NC	
DC NO	
DC NC	
AC NO	
AC NC	
检测距离 Detection distance	30cm

尺寸 Dimension: 10*30*65	
	
光纤放大器 Optical fiber amplifier	
规格specification	型号 Model
NPN NO	FS-V11
光纤管 Fiber optictube	FRS-310
光纤管 Fiber optictube	FT-310
光纤管 Fiber optictube	FRS-410
光纤管 Fiber optictube	FT-410
光纤管 Fiber optictube	FRS-610
光纤管 Fiber optictube	FT-610
检测距离 Detection distance	

尺寸 Dimension: 31*31*X	
	
保护光幕 Safety optical veiling	
光轴数 Number of beams	型号Model(光轴间距Optical axis spacing20mm)
8点	GY20-08NB
12点	GY20-12NB
16点	GY20-16NB
20点	GY20-20NB
24点	GY20-24NB
28点	GY20-28NB
检测距离 Detection distance	5m

尺寸 Dimension: 31*31*X	
	
保护光幕 Safety optical veiling	
光轴数 Number of beams	型号Model(光轴间距Optical axis spacing40mm)
4点	GY40-04NB
6点	GY40-06NB
8点	GY40-08NB
10点	GY40-10NB
12点	GY40-12NB
14点	GY40-14NB
16点	GY40-16NB
18点	GY40-18NB
检测距离 Detection distance	5m

尺寸 Dimension: 31*31*X	
	
保护光幕 Safety optical veiling	
光轴数 Number of beams	型号Model(光轴间距Optical axis spacing40mm)
20点	GY40-20NB
22点	GY40-22NB
24点	GY40-24NB
26点	GY40-26NB
28点	GY40-28NB
30点	GY40-30NB
32点	GY40-32NB
检测距离 Detection distance	5m