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2021 产品目录  
PRODUCTS CATALOG

光电传感器  
PHOTOELECTRIC SENSOR

## 企业简介 Company profile

健埃尔电子有限公司是专业生产光电开关, 标志传感器等自动化控制元件的科技型企业, 公司创建于1986年, 公司产品于1988年通过省级鉴定。2003年公司的白光源可转换标志传感器被评为浙江省高新技术产品, 并拥有多项国家专利。经过三十余年的发展, 目前公司占地10余亩, 建有2000多平方米的标准生产厂房, 并拥有二条全自动生产流水线。

公司产品广泛应用于工业、高科技及各种设备中作物位检测、液位控制、产品计数、速度监测、宽度判别、信号延时、色斑标记、定位纠偏、孔洞识别和安全防护装置、防盗警戒、张力控制等。

公司在国内的十余个省、市设有办事处, 并在俄罗斯、以色列、巴西、越南、斯里兰卡、印度、菲律宾和香港等国家和地区设有代理商。

公司为您奉献性价比最为合理的工控产品, 公司按照国标 ISO9000标准建立全面质量管理保证体系, 使产品的性能和质量达到九十年代国际同类产品的先进水平。各系列产品可直接与国外同类产品通用互换。

优良的产品性能、齐全的产品系列、雄厚的技术力量、优质的售后服务将与您携手共创辉煌的明天!

JL Electronic Co.,Ltd. is a special producer of automation components such as photo electric switches and mark sensors. The company was established in 1986 and its products quality has been appraised in the year of 1988. In 2003, its white light source transferable mark sensor was appraised hi-tech product of Zhejiang Province. The company has several patents. After development of nearly 30 years, the company at present owns a standard factory of 10 mu, 2000 square meters, facilitated by 2 full auto production lines.

Its products are widely used in industry for detecting material position, controlling liquid level, counting, measuring speed, recognizing width, postponing signal, marking color spot, correcting position, recognizing hole, protecting, alarming, manual tension controller etc.

It has domestic work offices in more than 10 provinces and cities and agents in Russia, Israel, Brazil, Vietnam, Sri Landka, India the Philippines and HongKong.

The company can provide you with industrial control products of high cost performance ratio. it has established total quality control system according to ISO9000 and therefore the products have reached the advanced international level of 1990s and can be exchangeable with the foreign products.

The excellent product quality, complete product series, abundant technical strength, and outstanding after-sale service of this company will help you to create a splendid tomorrow.

## 目录 CATALOGUE

### 纠偏控制系统 SERVO WEB GUIDE SYSTEM

EPC-A18 ..... 1

### 智能色标光电 CONTRAST SENSOR

JL-50 ..... 3

Z3K-ZN ..... 4

### 色标光电 MARK SENSOR

NT6 ..... 5

Z3K-T5 ..... 6

Z3N ..... 7

Z3S ..... 8

Z3J-Ts ..... 9

Z3J-Vs ..... 10

### 印刷机套色光电 PRINTING MARK SENSOR

ZDB ..... 11

### 红外光电 INFRARED SENSOR

Z3X ..... 12

Z3J-Ds ..... 13

Z3JK ..... 14

MR-60 ..... 15

### 纠偏光电 ULTRASONIC SENSOR

US-400 ..... 16

PS-400 ..... 17

ZPS-2 ..... 18

### 手动张力控制器 MANUAL TENSION CONTROLLER

JLTCM-225 ..... 19

JLTCM-226A ..... 20

JLTCM-226B ..... 21

JLTCM-226C ..... 22



# EPC-A18 纠偏控制系统

EPC-A18 SERVO WEB GUIDE SYSTEM

## • 产品介绍 (Product Introduction)

本产品是一款高性能的伺服纠偏系统，本系统能连接多种不同类型的纠偏传感器和推动器，支持EPC跟边LPC跟线，CPC对中，SPC错位（蛇形）等多种纠偏方式。使用彩色大屏幕触控屏作为人机界面，操作方便，美观大方，带有设置向导和在线帮助系统，就算第一次使用本系统，也能轻松完成基本设置。

Thank you very much for using the EPC-A18 servo correction system!  
The system can connect various types of rectifying sensors. And propeller, support EPC and side LPC with line, CPC pair, SPC misalignment (serpentine) and other correction methods. Use The color large screen touch screen is a human-machine interface. It is easy to operate, beautiful and generous, with a setup wizard and online help system. Even if you use this system for the first time, you can easily complete the basic setup.

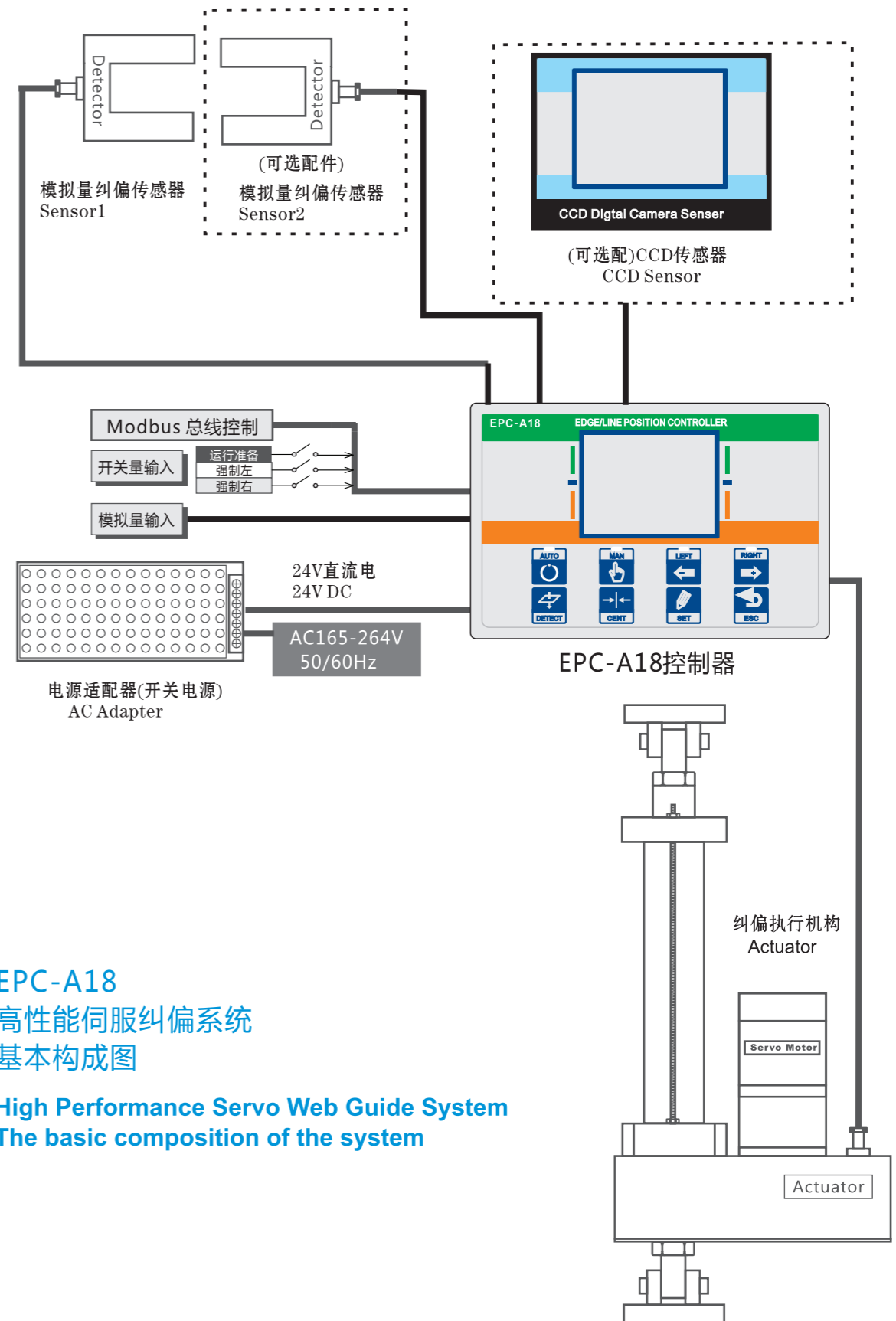
## • 功能特点 (Functional characteristics)

- 高性能伺服电机矢量驱动，速度响应迅速，支持直接扭矩控制，加减速，转速限制。
- 高速CPU运算，支持EPC跟边LPC跟线，CPC对中，SPC错位（蛇形）等多种纠偏方式。
- 支持超声波传感器，光电传感器，CCD传感器。
- 大屏幕彩色触摸屏，人机界面美观实用，操作简便。
- 集成设置向导和帮助系统，每个操作页均有帮助按钮，可查看简明帮助信息。
- 推动器采用伺服电机驱动滚珠丝杠，精度高，噪音少，免维护。
- 推动器带有编码器和绝对值直线位置反馈器，自适应不同机械行程，无须行程限位开关，限位位置永不漂移。
- 带有3路高速模拟量输入，可同时连接两个模拟量传感器和一路外控模拟量（例如微调位置，蛇形速度等）。
- 带有3路光电隔离的开关量输入，可单独设置不同的功能。
- 多重软硬件保护措施，工作稳定可靠，抗干扰能力强。针对各部件的失效有不同的失效紧急应对方案，保证24小时不间断运行。
- 灵活的安装方式。

- ▲ Motor high performance servo vector drive, fast speed response, support direct torque control, acceleration and deceleration, speed limit.
- ▲ High speed CPU operation, supporting EPC and edge L PC line, CPC alignment.SPC misalignment (snake) and other correction methods.
- ▲ It supports ultrasonic sensors, photoelectric sensors and CCD sensors.
- ▲ Large screen color touch screen, human-machine interface is beautiful and practical, easy to operate.
- ▲ Integrated setup wizard and help system. each operation page has help button to view concise help information.
- ▲ The driver has encoder and a bsolute value linear position feedback device. adaptable to different mechanical stroke, no need of travel limit switch, and the position of position will never drift.
- ▲ The propeller adopts servo motor to drive ball screw, with high accuracy, low noise and no maintenance.
- ▲ With 3 high-speed analog inputs, it can connect two analog sensors and one external control analog (such as fine-luning position, snake speed, etc.).
- ▲ The switch input wilh 3 photoelectric isolation can set different functions individually.
- ▲ Multiple software and hardware protection measures are stable and reliable, and have strong anti-interference ability. There are different emergency solu-tions for failure of components .Ensure uninterrupted operation for 24 hours.
- ▲ Flexible insta lation.

## • 技术参数 (Technical Parameters)

供电电压 Power supply voltage	DC24V~45V, 24V
电机驱动能力 Motor diving capability	DC24V ~ 45V, 10A Max
编码器供电电压 E-coders power supply vltage	DC15V, 200mAMax
模拟量输入 Analog input	3通道0~5V, 阻抗20K 3 channel0~5V; impedance 20K
传感器供电电压 Sensor power supply voltage	DC12V, 350mA Max
纠偏响应时间 Rectifying response time	0.5ms
模拟量输入分辨率 Analog input resolution	12位ADC 12 bit ADC
开关量输入 Switch input	3路NPN 3 road NPN
纠偏方式 Correction method	单边/线纠偏, 对中纠偏, 蛇形纠偏 3 way NPN unilateral/ line rectification, alignment correction, snake correction.
支持传感器类型 Support sensor type	超声波传感器, 光电传感器, CCD传感器 Ultrasonic sensor, photoelectric sensor, CCD sensor
推动器速度 Drive speed	1mm / s ~ 75mm / s
推动器推力 Drive thrust	100KgF~1500KgF
ESD ESD protection	IEC1000-4-2, ±15Kv ( Air ), ±8Kv ( Contact )
屏幕显示 Screen display	2.8寸26万色或4.3寸26万色 可选择 2.8 inch 260 thousand color or 4.3 inch 260 thousand color
人机交互方式 Hum an-computer interaction	TFP
防护等级 Protection grade	Ip53



EPC-A18  
高性能伺服纠偏系统  
基本构成图

High Performance Servo Web Guide System  
The basic composition of the system

## JL-50 系列智能色标传感器

JL-50 ZERIES CONTRAST SENSOR

### • 功能特点 (Features)

JL-50系列智能色标光电传感器内置PIC芯片，加载编程程序可对底色和色标进行智能识别，依据色差自动选择合适的光源以适应不同底色和色标。并且精度高，响应速度快，与传统Z3N和Z3S系列色标传感器相比，在色标与底色更换时，能自动选择光源，使用调节非常方便。

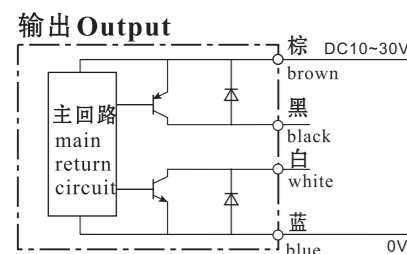
JL-50 series contrast sensor has built in PIC chip, the background and mark can be identified intelligently. The sensor chooses appropriate light according to the color difference of background and mark. In addition, compared with traditional Z3N and Z3S color mark sensor, Z3K-ZN is highly competitive and convenient due to its high precision and high response time

- 三色光源智能选择 RGB emission
- 灵敏度自动设定调节 Automatic sensitivity vegulation

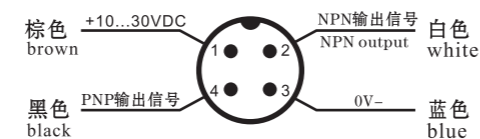
### • 技术参数 (Technical Parameters)

电源电压 Power supply	DC10-24V
电源纹波 Ripple	2Vpp最大 2Vpp max
输出信号 Output	1路NPN, 1路PNP 1 NPN output 1 PNP output
输出电流 Output current	100mA最大 100mA max
输出饱和电压 Output saturation voltage	≤2V
响应时间 Response time	33 μs
开关频率 Switching frequency	15kHz
状态指示 Indicators	输出指示灯 (黄)/准备指示灯 (绿) OUT LED(yellow)/READY LED(green)
输出方式 DARK/LIGHT selection	自动 Automatic
环境温度 Temperature	操作: -10~55℃ 保存: -20~70℃ operating:-10~5℃ storage:-20~70℃
检测距离 Operating distance	9mm+/-1mm
光源类型 Emission type	红、绿、蓝光自动选择 RED(630nm)/GREEN(520nm)/BLUE(465nm) with automatic selection
外壳材料 Housing Material	ABS
镜头材质 Lens Material	PMMA
防护等级 Mechanical protection	IP67
接线方式 Connection	M12 4芯电缆线 M12 4 core protection shielding cable
重量 weight	90g

### • 输出回路 (Output)



### • 接线方式 (Connection panel)



## Z3K-ZN 系列智能色标传感器

Z3K-ZN ZERIES CONTRAST SENSOR

### • 功能特点 (Features)

Z3K-ZN系列智能色标光电传感器内置PIC芯片，加载编程程序可对底色和色标进行智能识别，依据色差自动选择合适的光源以适应不同底色和色标。并且精度高，响应速度快，与传统Z3N和Z3S系列色标传感器相比，在色标与底色更换时，能自动选择光源，使用调节非常方便。

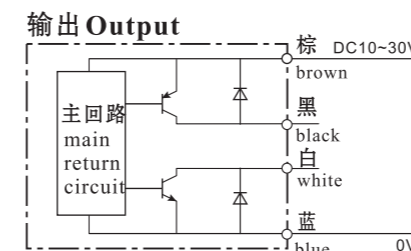
Z3K-ZN series contrast sensor has built in PIC chip, the background and mark can be identified intelligently. The sensor chooses appropriate light according to the color difference of background and mark. In addition, compared with traditional Z3N and Z3S color mark sensor, Z3K-ZN is highly competitive and convenient due to its high precision and high response time

- 三色光源智能选择 RGB emission
- 灵敏度自动设定调节 Automatic sensitivity vegulation

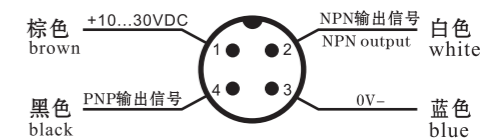
### • 技术参数 (Technical Parameters)

电源电压 Power supply	DC10-30V
电源纹波 Ripple	2Vpp最大 2Vpp max
输出信号 Output	1路NPN, 1路PNP 1 NPN output 1 PNP output
输出电流 Output current	100mA最大 100mA max
输出饱和电压 Output saturation voltage	≤2V
响应时间 Response time	33 μs
开关频率 Switching frequency	15kHz
状态指示 Indicators	输出指示灯 (黄)/准备指示灯 (绿) OUT LED(yellow)/READY LED(green)
输出方式 DARK/LIGHT selection	自动 Automatic
环境温度 Temperature	操作: -10~55℃ 保存: -20~70℃ operating:-10~5℃ storage:-20~70℃
检测距离 Operating distance	9mm+/-1mm
光源类型 Emission type	红、绿、蓝光自动选择 RED(630nm)/GREEN(520nm)/BLUE(465nm) with automatic selection
外壳材料 Housing Material	金属 Metal
防护等级 Mechanical protection	IP67
接线方式 Connection	M12 4芯电缆线 M12 4 core protection shielding cable
重量 weight	280g

### • 输出回路 (Output)



### • 接线方式 (Connection panel)

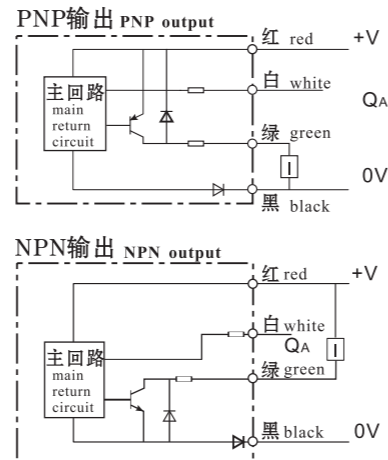


## NT6 系列色标传感器

NT6 ZERIES MARK SENSOR



### • 输出回路 (Output)



### • 外型尺寸 (Dimension)



### • 技术参数 (Technical Parameters)

检测方式	Detecting mode	同轴反射式	Coaxial reflecting
检测距离	Detecting distance	10mm ± 2mm	
供电电压Vs	Supply voltage	DC10-30V ± 10% 波纹 < 10%	DC10-30V +/- residual ripple < 10%
消耗电流	Current consumption	45mA 以下	Below 45mA
光源色谱	Light source	红 绿 蓝 白 可选	Red, green, blue or white, selectable
光点	Light spot	圆形、长条形光斑可选	Round, rectangular (selectable)
检测角度	Detecting angle	光线与被测物表面垂直 允许偏差 ± 15°	With light vertical to object, tolerance +/- 15
响应时间	Response time	50 μs	
输出方式	Output mode	亮动、暗动输出均有	With both light and dark operations
输出指示	Output dictator	红色LED	Red LED
输出电压	Output voltage	高电平Vs-( ≤ 1.5) 低电平 ( ≤ 1.2V)	High level Vs(≤ 1.5V), low level (≤ 1.2V)
带载电流	Load current	200mA	
模拟量输出	Analog output value	0-10mA	
电路保护装置	Circuit protection device	Vs电压有反极性保护, 输出有短路保护。当负载电流 > 200mA 时开关自动跳开, 而在 < 200mA 时信号又自动恢复。同时具有任意接线保护。	With reverse-polarity protection for Vs, short circuit protection for output. Switch off automatically when load current > 200mA and signal recovers when load current < 200mA, also with wiring error protection.
灵敏度	Sensitivity	多圈可调	Adjustable
防护等级	Protection class	Ip67 (防潮防尘)	Ip67 (humidity and dust proof)
环境温度	Ambient temperature	操作 -15~55℃ 保存 -25~80℃	Operation -15-55℃ storage -25-80℃
外壳材料	Housing material	金属	Metal
引出线	Connection cable	φ5.4PVC四芯护套屏蔽电缆 标准长2M	φ5.4 PVC 4 core protection shielding cable with standard length 2M

## Z3K-T5 系列色标传感器

Z3K-T5 ZERIES MARK SENSOR



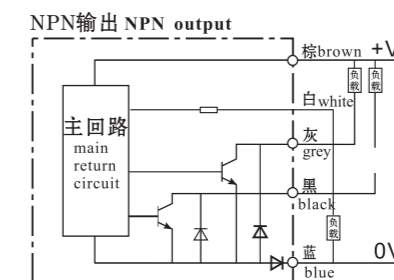
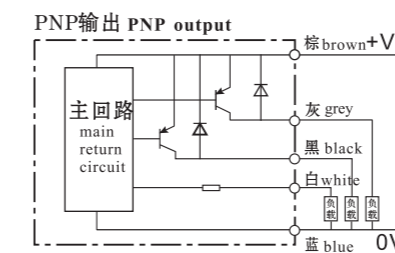
### • 功能特点 (Features)

- 同光轴光路结构  
Coaxial optical path structure
- 金属外壳抗干扰能力强  
High anti-interference ability
- 带有模拟量输出  
Analog output

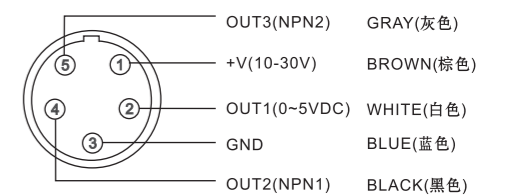
### • 技术参数 (Technical Parameters)

检测方式	Detecting mode	同轴反射式	Coaxial reflecting
检测距离	Detecting distance	12mm ± 3mm	
供电电压Vs	Supply voltage	DC10-30V ± 10% 波纹 < 10%	DC10-30V +/- residual ripple < 10%
消耗电流	Current consumption	45mA 以下	Below 45mA
光源色谱	Light source	红 绿 蓝 白 可选	Red, green, blue or white, selectable
光点	Light spot	圆形、长条形可选	Round, rectangular (selectable)
检测角度	Detecting angle	光线与被测物表面垂直 允许偏差 ± 15°	With light vertical to object, tolerance +/- 15
响应时间	Response time	0.1~1ms	
输出方式	Output mode	亮动、暗动均有	With both light and dark operations
输出指示	Output dictator	红色LED	Red LED
输出电压	Output voltage	高电平Vs-( ≤ 1.5) 低电平 ( ≤ 1.2V)	High level Vs(≤ 1.5V), low level (≤ 1.2V)
带载电流	Load current	100mA	
模拟量输出	Analog output value	电流输出: 0-10mA 电压输出: 0-5V	Current output 0-10mA Voltage output 0-5V
电路保护装置	Circuit protection device	Vs电压有反极性保护, 输出有短路保护。同时具有任意接线保护。	With reverse-polarity protection for Vs, short circuit protection for output. also with wiring error protection.
灵敏度	Sensitivity	单圈可调	Adjustable
抗环境光	anti-background light	白炽灯3000Lx 太阳光1000Lx	sunlight < 1000 LX incandescent light < 3000 LX
防护等级	Protection class	IP67 (防潮防尘)	Ip67 (humidity and dust proof)
环境温度	Ambient temperature	操作 -15~65℃ 保存 -25~80℃	Operation -15-65℃ storage -25-80℃
外壳材料	Housing material	金属	Metal
引出线	Connection cable	φ6.0五芯护套屏蔽电缆带航空插 标准长2M	φ6.0 PVC 5 core protection shielding cable with standard length 2M

### • 输出回路 (Output)



### • 接线方式 (Connection panel)



## Z3N 系列色标传感器

Z3N ZERIES MARK SENSOR



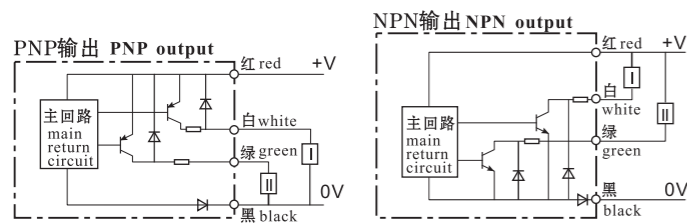
### • 功能特点 (Features)

- 抗干扰能力强 high anti-interference ability
- 多光源选择 multiple color combination
- 高分辨率 high resolution ratio
- 高性价比 high cost performance

### • 型号表 (Type table)

型号 Mode	光源 Light source	引出线 Connection cable
T22	红绿 (圆点) red/green (spot)	四芯 4 core
TB22	绿蓝 (圆点) green/blue (spot)	四芯 4 core
TW22	绿白 (圆点) green/white (spot)	四芯 4 core
T2	红绿 red/green	三芯 3 core
T22-2	红绿 (长条) red/green (strip)	四芯 4 core
TB22-2	绿蓝 (长条) green/blue (strip)	四芯 4 core
TW22-2	绿白 (长条) green/white (strip)	四芯 4 core
TB2	绿蓝 green/blue	三芯 3 core

### • 输出回路 (Output)



### • 技术参数 (Technical Parameters)

检测方式 Detecting mode	同轴反射式 Coaxial reflecting
检测距离 Detecting distance	10mm ± 2mm
供电电压Vs Supply voltage	DC10-30V ± 10% 波纹 < 10% DC10-30V +/- residual ripple < 10%
消耗电流 Current consumption	45mA 以下 Below 45mA
光源色谱 Light source	红 绿 蓝 白 Red, green, blue or white, selectable
光点 Light spot	φ0.5~φ1.5
检测角度 Detecting angle	光线与被测物表面垂直 允许偏差 ± 15 With light vertical to object, tolerance +/- 15
响应时间 Response time	0.1~1ms
输出方式 Output mode	亮动、暗动可选 With both light and dark operations
输出指示 Output dictator	红色LED Red LED
输出电压 Output voltage	高电平Vs-( ≤ 1.5) 低电平 ( ≤ 1.2V) High level Vs( ≤ 1.5V), low level ( ≤ 1.2V)
带载电流 Load current	200mA(max)
电路保护 装置 Circuit protection device	Vs电压有反极性保护, 输出有短路保护。 当负载电流 I > 200mA 时开关自动跳开, 而在 I < 200mA 时 信号又自动回复。同时具有任意接线保护。 With reverse-polarity protection for Vs, short circuit protection for output. Switch off automatically when load current > 200mA and signal recovers when load current < 200mA, also with wiring error protection.
灵敏度 Sensitivity	单圈可调 Adjustable
抗环境光 anti-background light	白炽灯 < 3000Lx 太阳光 1000Lx sunlight < 1000 LX incandescent light < 3000 LX
防护等级 Protection class	Ip67 (防潮防尘) Ip67(humidity and dust proof)
环境温度 Ambient temperature	操作 -15-65℃ 保存 -25-80℃ Operation -15-65℃ storage -25-80℃
外壳材料 Housing material	金属 Metal
引出线 Connection cable	φ5.4PVC四芯护套屏蔽电缆 标准长2M φ5.4 PVC 4 core protection shielding cable with standard length 2M
重量 weight	大约500g About 500g

## Z3S 系列色标传感器

Z3S ZERIES MARK SENSOR



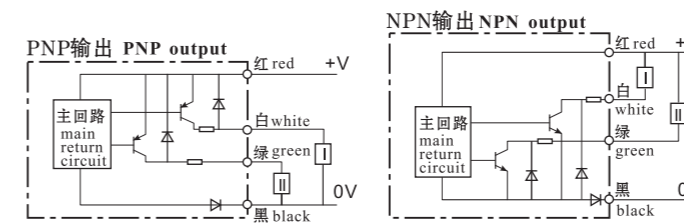
### • 功能特点 (Features)

- 抗干扰能力强 high anti-interference ability
- 多光源选择 multiple color combination
- 高分辨率 high resolution ratio
- 高性价比 high cost performance

### • 型号表 (Type table)

型号 Mode	光源 Light source	引出线 Connection cable
T22	红绿 (圆点) red/green (spot)	四芯 4 core
TB22	绿蓝 (圆点) green/blue (spot)	四芯 4 core
TW22	绿白 (圆点) green/white (spot)	四芯 4 core
KS-C2	单点 (圆点) single point (spot)	四芯 4 core
T2	红绿 red/green	三芯 3 core
T22-2	红绿 (长条) red/green (strip)	四芯 4 core
TB22-2	绿蓝 (长条) green/blue (strip)	四芯 4 core
TW22-2	绿白 (长条) green/white (strip)	四芯 4 core
KS-W22	单点 (圆点) single point (strip)	四芯 4 core
TB2	绿蓝 green/blue	三芯 3 core

### • 输出回路 (Output)



### • 技术参数 (Technical Parameters)

检测方式 Detecting mode	同轴反射式 Coaxial reflecting
检测距离 Detecting distance	10mm ± 2mm
供电电压Vs Supply voltage	DC10-30V ± 10% 波纹 < 10% DC10-30V +/- residual ripple < 10%
消耗电流 Current consumption	45mA 以下 Below 45mA
光源色谱 Light source	红 绿 蓝 白 Red, green, blue or white, selectable
光点 Light spot	φ0.5~φ1.5
检测角度 Detecting angle	光线与被测物表面垂直 允许偏差 ± 15 With light vertical to object, tolerance +/- 15
响应时间 Response time	0.1~1ms
输出方式 Output mode	亮动、暗动可选 With both light and dark operations
输出指示 Output dictator	红色LED Red LED
输出电压 Output voltage	高电平Vs-( ≤ 1.5) 低电平 ( ≤ 1.2V) High level Vs( ≤ 1.5V), low level ( ≤ 1.2V)
带载电流 Load current	200mA(max)
电路保护 装置 Circuit protection device	Vs电压有反极性保护, 输出有短路保护。 当负载电流 I > 200mA 时开关自动跳开, 而在 I < 200mA 时 信号又自动回复。同时具有任意接线保护。 With reverse-polarity protection for Vs, short circuit protection for output. Switch off automatically when load current > 200mA and signal recovers when load current < 200mA, also with wiring error protection.
灵敏度 Sensitivity	单圈可调 Adjustable
抗环境光 anti-background light	白炽灯 < 3000Lx 太阳光 1000Lx sunlight < 1000 LX incandescent light < 3000 LX
防护等级 Protection class	Ip67 (防潮防尘) Ip67(humidity and dust proof)
环境温度 Ambient temperature	操作 -15-65℃ 保存 -25-80℃ Operation -15-65℃ storage -25-80℃
外壳材料 Housing material	塑料 Metal
引出线 Connection cable	φ5.4PVC四芯护套屏蔽电缆 标准长2M φ5.4 PVC 4 core protection shielding cable with standard length 2M
重量 weight	大约300g About 300g

## Z3J-Ts 系列色标传感器

Z3J-Ts SERIES MARK SENSOR

### • 型号选择 (Model option)

本系列产品定货时, 请按如下命名方式选购所定型号:

This series of products named in the following way:

Z3J-Ts2 □ E3

□ — 光源选择: “R”表示红色光源, “G”表示绿色光源, “B”表示蓝色光源, “W”表示白色光源。

Light source: R for red, G for green, B for blue, W for white

## Z3J-Vs 系列色标传感器

Z3J-Vs SERIES MARK SENSOR

### • 型号选择 (Model option)

本系列产品定货时, 请按如下命名方式选购所定型号:

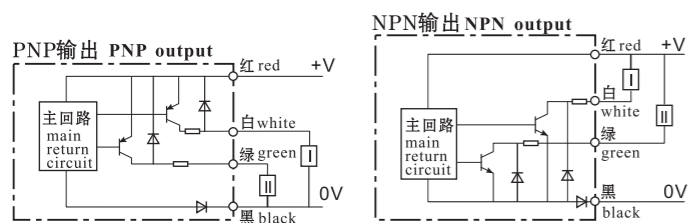
This series of products named in the following way:

Z3J-Vs 2 □ E3

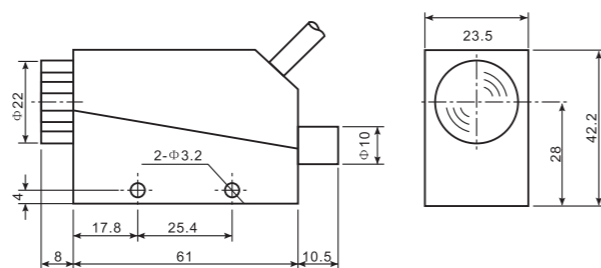
□ — 光源选择: “R”表示红色光源, “G”表示绿色光源

Light source: R for red, G for green

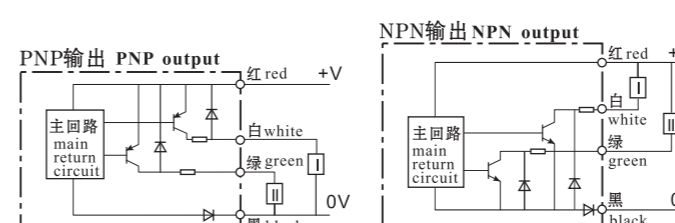
### • 输出回路 (Output)



### • 外型尺寸 (Dimension)



### • 输出回路 (Output)



### • 型号表 (Type table)

类型 Type	标志传感器 Mark Photoelectric sensor		
	绿光 green	红光 red	
检出距离 Detecting distance	10cm	10cm	
安装方式 Installation mode	直式 Straight type	Vs2GE3	Vs2RE3
	侧式 Side type	Vs2GE31	VsRE31

### • 技术参数 (Technical Parameters)

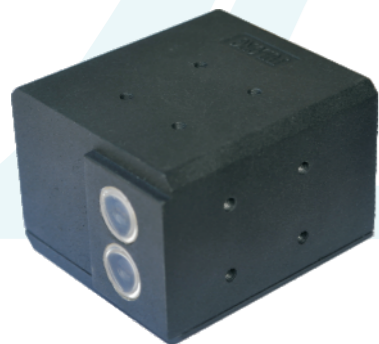
检测方式 Detecting mode	同轴反射式 Coaxial reflecting	
检测距离 Detecting distance	15mm ± 2mm	
供电电压Vs Supply voltage	DC10-30V ± 10%	波纹 < 10% DC10-30V +/- residual ripple < 10%
消耗电流 Current consumption	45mA 以下 Below 45mA	
光源色谱 Light source	红 绿 蓝 白 Red, green, blue or white, selectable	
光点 Light spot	红长条形光斑 Red rectangular light spot	
检测角度 Detecting angle	光线与被测物表面垂直 允许偏差 ± 15 With light vertical to object, tolerance +/- 15	
响应时间 Response time	1ms	
输出方式 Output mode	亮动、暗动可选 With both light and dark operations	
输出指示 Output dictator	红色LED Red LED	
输出电压 Output voltage	高电平Vs-( ≤ 1.5) 低电平( ≤ 1.2V) High level Vs(≤ 1.5V), low level(≤ 1.2V)	
带载电流 Load current	200mA(max)	
电路保护 装置 Circuit protection device	Vs电压有反极性保护, 输出有短路保护。 当负载电流I > 200mA时开关自动跳开, 而在I < 200mA时信号又自动回复。同时具有任意接线保护。 With reverse-polarity protection for Vs, short circuit protection for output. Switch off automatically when load current > 200mA and signal recovers when load current < 200mA, also with wiring error protection.	
灵敏度 Sensitivity	单圈可调 Adjustable	
抗环境光 anti-background light	白炽灯 < 3000Lx 太阳光 1000Lx sunlight < 1000 LX incandescent light < 3000 LX	
防护等级 Protection class	Ip67 (防潮防尘) Ip67(humidity and dust proof)	
环境温度 Ambient temperature	操作 -15-65℃ 保存 -25-80℃ Operation -15-65℃ storage -25-80℃	
外壳材料 Housing material	金属 Metal	
引出线 Connection cable	φ5.4PVC四芯护套屏蔽电缆 标准长2M φ5.4 PVC 4 core protection shielding cable with standard length 2M	
重量 weight	大约300g	

### • 技术参数 (Technical Parameters)

检测距离 Detecting distance	10mm ± 1mm	
供电电压Vs Supply voltage	DC12-24V ± 10%	波纹 < 10% DC10-30V +/- residual ripple < 10%
消耗电流 Current consumption	45mA 以下 Below 45mA	
标准检测物 Standard test object	5x10mm 黑标记 5x10mm Black mark	
带载电流 Load current	100mA	
输出压降 Output voltage	1V(max)	
响应时间 Response time	2ms	
灵敏度 Sensitivity	单圈可调 Adjustable	
动作方式 Output mode	亮动、暗动均有 With both light and dark operations	
动作指示 Output dictator	红色LED Red LED	
防护等级 Protection class	IP64	
外壳材料 Housing material	金属 Metal	
光源色谱 Light source	绿色 (G) 红色 (R)	
引出线 Connection cable	φ5.4PVC 护套电缆, 标准长2m φ5.4 PVC 4 core protection shielding cable with standard length 2M	
环境温度 Ambient temperature	工作 -25℃~55℃ Operation -15-55℃	

## ZDB 系列印刷机套色光电开关

ZDB ZERIES PRINTING MARK SENSOR



### • 型号选择 (Model option)

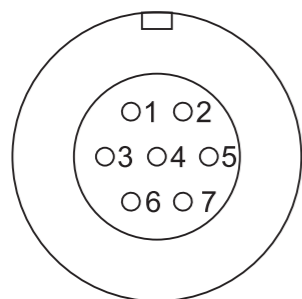
- (1) ZDB-2B: 单色蓝光源  
ZDB-2B: single color blue light source
- (2) ZDB-2W: 单色白光源  
ZDB-2W: single color white light source
- (3) ZDB-2BW: 白光源、蓝光源可转换  
ZDB-2BW: convertible between white and blue light source

注: 特殊要求的光源, 需定做。  
Note: special light source can be order made.

### • 技术参数 (Technical Parameters)

供电电压 Voltage supply	DC10-30V ±10% 波纹 <10% DC10-30V +/-10% wave<10%
消耗电流 Work currenncy	100mA 以下 Below 100mA
光源色谱 Light source spectrum	白色LED 蓝色LED White LED, blue LED
光点 Light spot	正方形光斑或长条形光斑 (二路光斑间距20mm ±0.1mm) Square light spot/rectangular light spot (light spot distance 20mm +/-0.1mm)
检测距离 Checking distance	11mm ±1mm
响应时间 Reaction time	<0.05ms
输出方式 Output mode	开关量信号, 模拟量信号均有 With switch volume show and analog output volume show
带载电流 Currenncy load	100mA(开关量输出); 5mA (模拟量输出) 100mA(switch volume output); 5mA (analog volume output)
灵敏度 Sensitivity	多圈可调 (用于开关量输出) With adjustable different levels (for switch output volume)
防护等级 Protection grade	Ip64
环境温度 Work temperature	工作: 15-65℃ 贮存: 25-80℃ Work condition: 15-65 Celsius degrees; storage: 25-80 Celsius degrees
外壳材料 Shell material	金属 metal

### • 接线方式 (Connection panel)



- |                     |  |
|---------------------|--|
| 1 — 电源正极 (10-30VDC) | 1. Positive pole of power (10-30VDC)               |
| 2 — 屏蔽 (外壳)         | 2. Shielded shell                                  |
| 3 — T2模拟量输出         | 3. T2 analog volume output                         |
| 4 — T2开关量输出 (浅色动作)  | 4. T2 switch volume output (light color operation) |
| 5 — 电源负极 (地)        | 5. Negative pole of power (to ground)              |
| 6 — T1模拟量输出         | 6. T1 analog volume output                         |
| 7 — T1开关量输出 (浅色动作)  | 7. T1 switch volume output (light color operation) |

## Z3X 系列红外传感器

Z3X ZERIES INFRARED SENSOR

### 超小型光电传感器

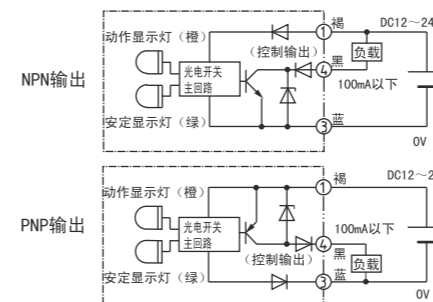
### • 功能特点 (Features)

- 体积超小型 10.8 (W) X20.0 (H) X31.0 (L)  
Small size
- 高占空比, 开关电源调制解调专用电容  
High duty vatio
- 自恢复短路保护  
Self-recovery short circuit protection
- 反向过压保护  
Reverse overvoltage protection

### • 型号表 (Type table)

检测方式 Detecting mode	漫反射型 Reflex mode				回归反射型 Retro reflective mode	对射型 Through-beam mode
型号 Mode	Z3X-R10E3	Z3X-R30E3	Z3X-H50E3	Z3X-H100E3	Z3X-T150E3	Z3X-D200E3
光源 Emitter	红色LED Red LED		红外LED Infrared LED		红外LED Infrared LED	红外LED Infrared LED
检测距离 Checking distance	≤ 10cm	≤ 30cm	≤ 50cm	≤ 100cm	≤ 150cm	≤ 200cm
检测物 test object	白画纸 White paper		白画纸 White paper	φ 10不透明物 Untransparent material	φ 50不透明物 Untransparent material	

### • 输出回路 (Output)



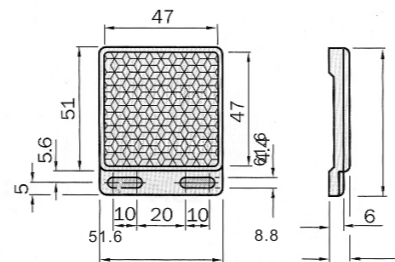
### • 技术参数 (Technical Parameters)

工作电压 Operating voltage	DC10-30V ±10% 波纹 <20% DC10-30±10% ripple <20%
输出方式 Output method	NPN & PNP 两种输出 NPN&PNP
输出状态 Output status	常开/常闭 Normal open/closed
输出电流 Output current	150mA 最大 Maximum 150mA
泄漏电流 Leakage current	0.8mA 最大 Maximum 0.8mA
残流电压 Residual voltage	0.6V max Max.0.6V
保护电路 Protection circuit	短路保护、极性保护 Short circuit & polarity reversed protection
反应时间 Response time	1ms max 1ms max.
灵敏度调节 Sensitivity adjuster	270° 单方向旋钮 270° trimmer
光源 Emitter	红色 LED, 红外 LED Red LED, Infrared LED
指示灯 indicator light	动作指示灯: 红色; 稳定指示灯: 绿色 Operation indicator light: Red, Stability indicator light: Green
迟滞 hysteresis	10% 最大检距 10% sensing distance Max.
外壳材料 Housing material	工程塑料 Engineering plastics
工作温度、湿度 Operatiing temperature/humidity	温度 -20℃~60℃; 湿度 35%~85% Temperature -20℃~60℃; humidity 35%~85%
接线方式 Connection method	φ 4.0PVC 3芯护套电缆, 标准长2m φ 4.0 PVC sheath cable, standard length 2m
备注 Remarks	防水度: IP-65 Water proof: IP-65



## Z3J-Ds 系列红外传感器

Z3J-Ds ZERIES INFRARED SENSOR

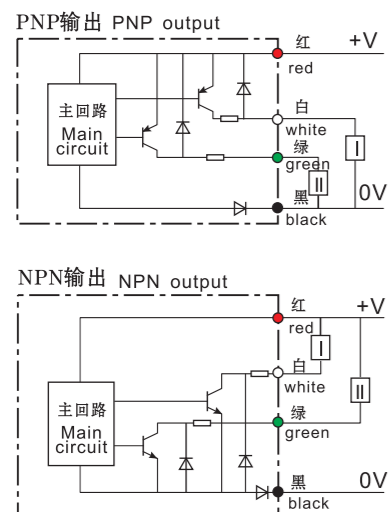


Reflectors (only: Reflex mode)  
Size: 47 x 47 mm

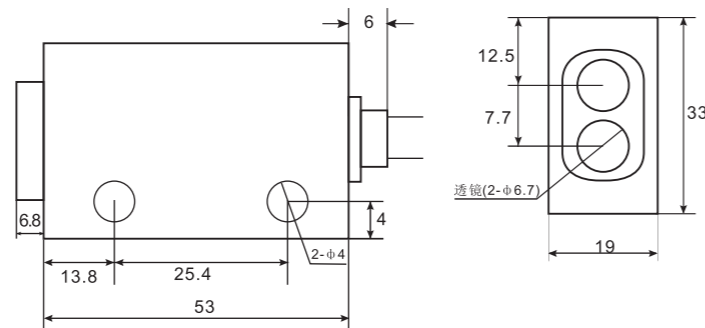
### • 技术参数 (Technical Parameters)

型号 checking mode	对射方式 Through-beam mode		漫反射方式 Reflex mode		
	Z3J-2C3	Z3J-3C3	Z3J-Ds30E3	Z3J-Ds50E3	Z3J-Ds100E3
检测距离 checking distance	2 m	3 m	30 cm	50 cm	100 cm
工作电压 voltage supply	DC10-30V ±10% 波纹<10% DC10-30V ±10% wave<10%				
消耗电流 currency load	30mA(max)				
输出电压 output voltage	$V_H \leq V_C - 1.5V$ $V_L \leq 1.2V$				
输出方式 output mode	亮动、暗动均有 Operate with light or without light				
响应时间 response time	1ms				
环境温度 enviroment protection temperature	工作-15℃~65℃ 储存 -25℃~80℃		Work at -15℃~65℃ Storage -25℃~80℃		
引出线 connection wire	φ5.4PVC 4芯套电缆 长度2m		φ5.4PVC 4-core cable L=2m		
外壳材料 shell material	金属 Metal				

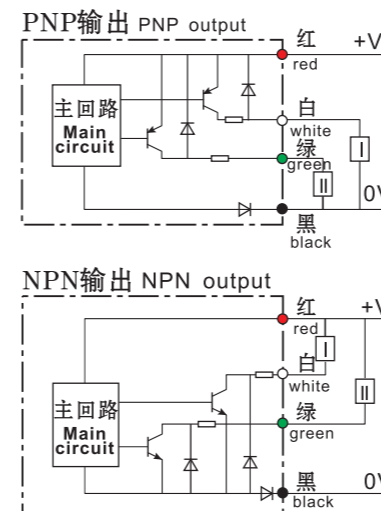
### • 输出回路 (Output)



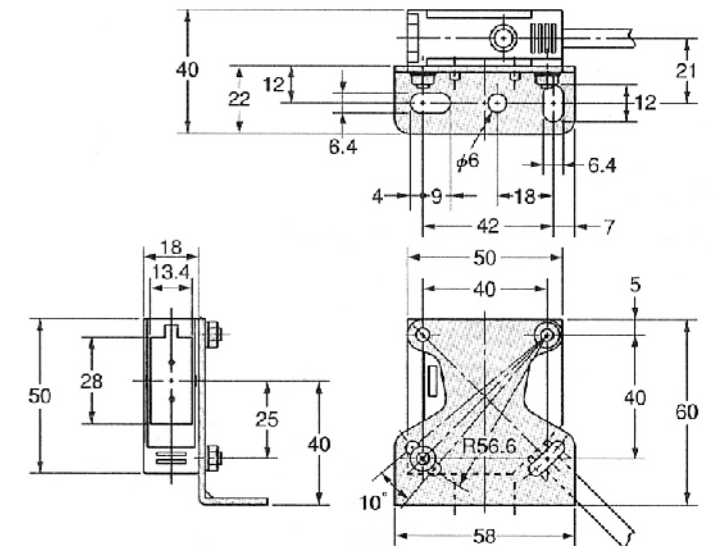
### • 外型尺寸 (Dimension)



### • 输出回路 (Output)

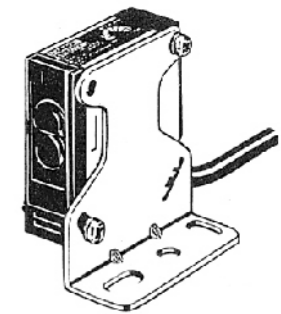


### • 外型尺寸 (Dimension)



## Z3JK 系列红外传感器

Z3JK ZERIES INFRARED SENSOR



### • 技术参数 (Technical Parameters)

型号 checking mode	对射方式 Through-beam mode		漫反射方式 Reflex mode		
	Z3JK-2C3	Z3JK-3C3	Z3JK-Ds30E3	Z3JK-Ds50E3	Z3JK-Ds100E3
检测距离 checking distance	2 m	3 m	30 cm	50 cm	100 cm
工作电压 voltage supply	DC10-30V ±10% 波纹<10% DC10-30V ±10% wave<10%				
消耗电流 currency load	30mA(max)				
输出电压 output voltage	$V_H \leq V_C - 1.5V$ $V_L \leq 1.2V$				
输出方式 output mode	亮动、暗动均有 Operate with light or without light				
响应时间 response time	1ms				
环境温度 enviroment protection temperature	工作-15℃~65℃ 储存 -25℃~80℃		Work at -15℃~65℃ Storage -25℃~80℃		
引出线 connection wire	φ5.4PVC 4芯套电缆 长度2m		φ5.4PVC 4-core cable L=2m		
外壳材料 shell material	塑料 Plastic				

## MR-60 系列小型光电传感器

### MR-60 SERIES MINI PHOTO ELECTRIC SENSOR

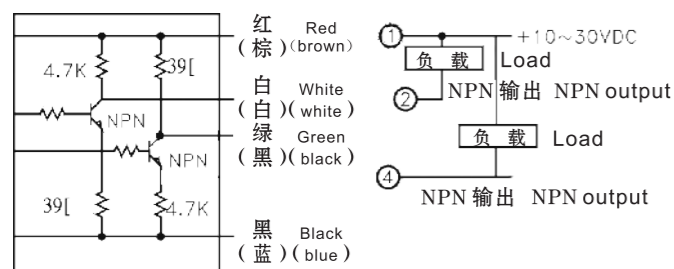


- \* 高紧凑型结构 12.5 (W) X25.0 (H) X30.0 (L)  
Highly Compact Construture 12.5 (W) x 25.0 (H) x 30.0 (L)
- \* 高防护 IP-65  
High Protection IP-65
- \* 检测距离长  
Detection Distance
  - 漫反射: 30cm, 60cm  
Diffuse reflection: 30cm, 60cm
  - 镜片反射: 2m  
Mirror reflection: 2m
  - 对射: 6m  
Through Beam: 6m

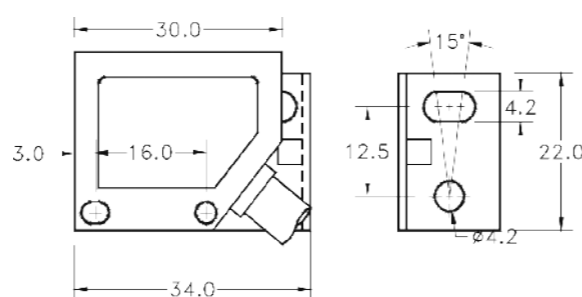
#### • 技术参数 (Technical Parameters)

工作电压	Operating voltage	DC10-30V ±10%	波纹 < 20%	DC10-30±10% ripple < 20%
输出方式	Output method	NPN & PNP 两种输出		NPN&PNP
输出状态	Output status	常开/常闭		Normal open/closed
输出电流	Output current	150mA 最大	Maximum 150mA	
泄漏电流	Leakage current	0.8mA 最大	Maximum 0.8mA	
残流电压	Residual voltage	0.6V max	Max.0.6V	
保护电路	Protection circuit	短路保护、极性保护		Short circuit & polarity reversed protection
反应时间	Response time	2ms max	2ms max.	
灵敏度调节	Sensitivity adjuster	270° 可调	270° trimmer	
光源	Emitter	红外 LED		Infrared LED
光照条件	Illumination	太阳光 < 10,000 Lux.; 灯光 < 5,000 Lux.	Sunlight < 10,000 Lux.; lamplight < 5,000 Lux.	
迟滞	hysteresis	10% 最大检距	10% sensing distance Max.	
外壳材料	Housing material	工程塑料		Engineering plastics
工作温度、湿度	Operation temperature/humidity	温度 -20℃~60℃; 湿度 35%~85%		Temperature -20℃-60℃; humidity 35%-85%
接线方式	Connection method	φ 5.0PVC 护套电缆, 标准长2m		φ 5.0 PVC sheath cable, standard length 2m
备注	Remarks	防水度: IP-65		Water proof: IP-65

#### • 输出回路 (Features)



#### • 外型尺寸 (Dimension)



## US-400S 系列纠偏光电传感器

### US-400S ZERIES ULTRASONIC SENSOR

#### 槽型超声波传感器 Ultrasonic sensor

超声波纠偏传感器应用高频超声波直线传播的原理, 用来检测卷材的边缘位置。与光电传感器相比, 不会受材料透明度的影响, 所以使用时无需调节, 非常方便。适用于不透气材料 (例如塑料薄膜, 纸张等等) 的追边应用 (透气材料例如布, 无纺布不适用)。

Ultrasonic sensor applies the principle of high frequency ultrasonic linear transmission to detect the edge of the material, comparing to photoelectric sensor, it will not be affected by the transparency of the materials. Thus it is very convenient and no need to adjust. It is suitable for edge application of opaque material (such as plastic film, paper etc and transparent material, such as cloth, but not for non-woven fabrics.).

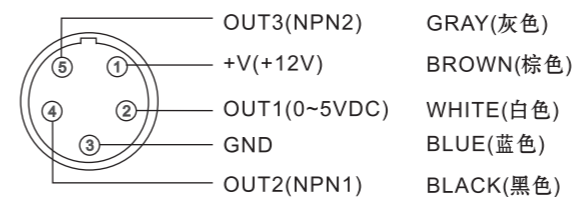
#### • 技术参数 (Technical Parameters)

跟踪方式	对边跟踪
Tracking method	Edge tracking
电源输入	DC12V
Power input	DC12V
输出信号	0~5V双路开关量信号
Output signal	0-5V two way switch signal
检测范围	6mm ( ± 3.0mm )
Detecting range	6mm ( ± 3.0mm )
检测精度	± 0.05mm
Detecting precision	± 0.05mm
外壳材质	铝合金
Housing material	Aluminum alloy
重量	250g
weight	250g

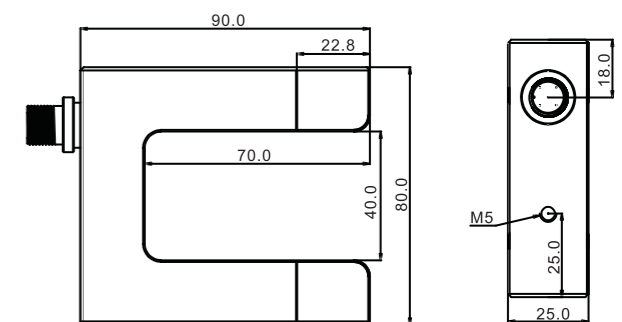
#### • 功能特点 (Functions and features)

1. 支持一路模拟量/二路开关量输出  
Support 1 way analogue/2 way on-off output
2. 适合于所有不透气的材料 (如透明薄膜、纸张等)  
Suitable for all air impermeable materials (such as transparent film, paper etc.)
3. 无需人工调整校准  
No need for manual calibration.
4. 200K超声波对射  
200K ultrasonic correlation
5. 0.05m/s反应时间  
0.05m/s response time
6. 检测范围6mm, 检测精度智能调节  
Detecting range: 6mm, precision intelligent setting
7. 自带偏移量显示  
With own offset display

#### • 接线方式 (Connection interface)



#### • 外型尺寸 (Dimension)



## PS-400S 系列纠偏光电传感器

PS-400S SERIES PHOTOELECTRIC SENSOR

### 槽型光电传感器 Slot photoelectric sensor

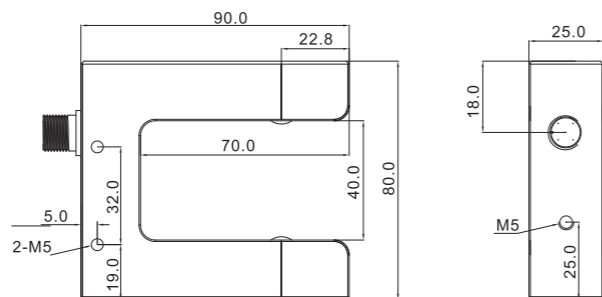
PS-400S光电传感器是基于可见光的对射型纠偏传感器，适用于对卷材的追边应用。

Through beam web guiding sensor based on visible light, suitable for edge tracking of rolling materials.

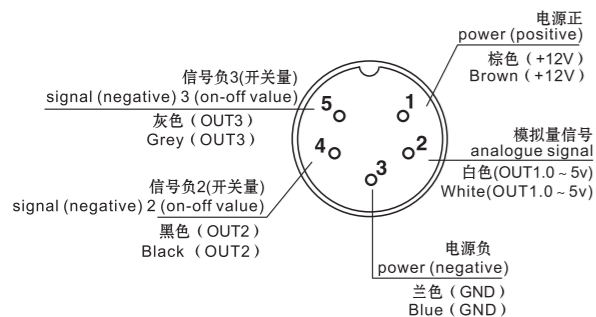
#### • 功能特点 (Functions and features)

- 支持模拟量/开关量输出  
Support analogue/on-off output
- 适合于不透明、透明薄膜的追边应用，无纺布、网格布也可适用  
Suit for edge tracking of opaque, transparent thin film.
- 可见光对射  
through beam of visible light
- 100K频率载波编码，不受环境光线影响  
carrier coding with frequency of 100K, not affected by ambient lights
- 检测范围5mm，检测精度智能调节  
detecting range: 5mm, precision intelligent setting
- 高稳定性, 高精度  
high stability and precision
- 更换纠偏材料，需重新调整校准  
change material, sensor needs readjustment

#### • 外型尺寸 (Dimension)



#### • 接线方式 (Connection interface)



#### • 技术参数 (Technical Parameters)

跟踪方式 Tacking method	对边追踪 Edge tracking
电源输入 Power input	DC10 ~ 30V
输出信号 Signal output	双路模拟量0~5V双路NPN型开关量 Two-way analogue 0~5V, Two-way NPN on-off signal
检测范围 Detecting range	8mm
可调精度 Detecting precision	检测精度智能调节 Intelligent calibration
检测方式 Detecting method	光电对射 Photoelectric opposite beam
载波频率/响应频率 Carrier frequency / response frequency	100KHz/1KHz
防护等级 Protection level	IP54
重量 Weight	250g
环境 Environmen temperature	-10 ~ 80℃, RH90% 以下 -10~80℃, below RH90%
外壳材质 Housing	铝合金 Aluminum Alloy
材料校准 Material calibration	需要 needed

## ZPS-2 系列纠偏光电传感器

ZPS-2 SERIES PHOTOELECTRIC SENSOR

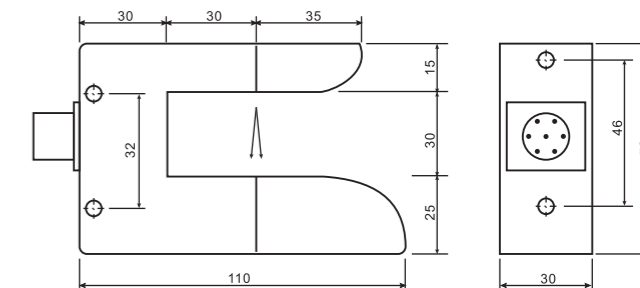
### 槽型双路控制标志传感器

U shape double circuit control mark sensor

#### • 功能特点 (Functions and features)

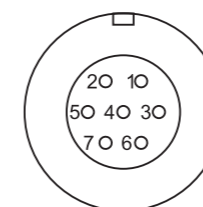
- 支持模拟量/开关量输出  
Support analogue/on-off output
- 适合于不透明、透明薄膜的追边应用，无纺布、网格布也可适用  
Suit for edge tracking of opaque, transparent thin film.
- 可见光对射  
through beam of visible light
- 电位器调节精度  
potentiometer adjusts detection accuracy

#### • 外型尺寸 (Dimension)



#### • 接线方式 (Connection interface)

- 1— OUT1 (数字量输出)  
1.---OUT1(digital output)
- 2— OUT2 (数字量输出)  
2.---OUT2(digital output)
- 3— OUT1 (模拟量输出)  
3.---OUT1(analogue output)
- 4— 空  
4.---empty(blank)
- 5— 电源负  
5.---power negative end
- 6— OUT2 (模拟量输出)  
6.---OUT2(analogue output)
- 7— 电源正  
7.---power positive end



#### • 技术参数 (Technical Parameters)

供电电压Vs Voltage supply	DC10-30V ±10%	波纹 <10%	DC10-30V+ <sub>0%</sub> ripple<10%
消耗电流 Currency consumption	50mA 以下	Blow 50mA	
光源光谱 Light source	白色LED 红色LED 蓝色LED 绿色LED	White LED Red LED blue LED or Green LED	
双路间距 Space distance	0.5mm~3mm		
检测方式 Check method	对射式 Anti-shooting		
响应时间 Response	<0.1ms		
输出方式 Output mode	亮动、暗动均有 With switch volume show and analog output volume show		
带载电流 Loaded currency	100mA		
灵敏度 Sensitivity	单圈可调 Single ring (coil)-adjustable		
防护等级 Protection grade	Ip64		
环境温度 Enviroment temperature	工作: 15-65℃ 贮存: 25-80℃ Work: 15-65C storage: 25-80C		
外壳材料 Outer shell material	工程塑料 Engineering plastics		

## JLTCM-225 手动张力控制器

### JLTCM-225 MANUAL TENSION CONTROLLER



JLTCM 225 手动张力控制器适合驱动扭矩20kgm以下的磁粉制动器/离合器，典型应用在电子材料贴合机或贴膜机、贴标机及印刷机排废张力控制上。

JLTCM225 Manual tension controller is adaptive to magnetic powder brake/clutch with driving torque less than 20kgm. It is widely applied in the sticking film machine, labeling machine and waste discharge of the printing machine.

#### • 功能特点 (Functions and features)

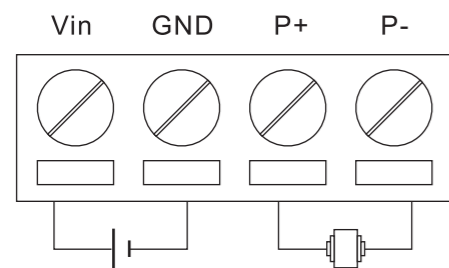
JLTCM 225 = 张力板 + 电位器 + 显示表头 + 开关

- \* 96\*48外壳，产品占控制屏位置少，减少了安装空间。
- \* 恒定电流输出，张力更稳定。
- \* 电位器改为使用编码器设定，更精确可靠。
- \* 24V供电，多台可共用一个开关电源，连接器可插拔，接线更方便。
- \* 开关：触按旋钮后放开，显示灭，输出0电流。再按旋钮后放开返回原值。

JLTCM225=tension board+ potentiometer+display screen+switch

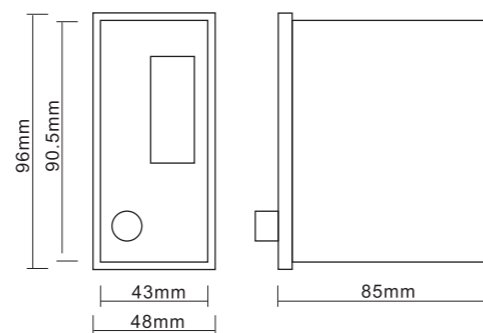
- \*96x48 shell, products occupies less space of the control screen, reduce the installation space.
- \*constant current output, more stable tension
- \*encoder setting, more precise.
- \*24V power supply, multiple tension controller share one switching power supply, convenient connection.

#### • 端子排接线 (Terminal connection diagram)



其中，(Vin, GND) 接直流电源24V, (P+, P-) 接磁粉离合器  
(24V, 0V) connect 24DC power supply, (P+, P-) connect magnetic powder clutch.

#### • 外型尺寸 (Dimension)



面板尺寸宽\*高\*深 mm 96\*48\*85  
面板开孔参考尺寸 mm 90.5\*43

## JLTCM-226A 手动张力控制器

### JLTCM-226A MANUAL TENSION CONTROLLER



JLTCM 226A 是一款经济型小体积手动张力控制器，适合驱动扭矩10kgm以下的磁粉制动器/离合器，典型应用在电子材料贴合机或贴膜机、贴标机及印刷机排废张力控制上。

JLTCM226A Manual tension controller is adaptive to magnetic powder brake/clutch with driving torque less than 10kgm. It is widely applied in the sticking film machine, labeling machine and waste discharge of the printing machine.

#### • 功能特点 (Functions and features)

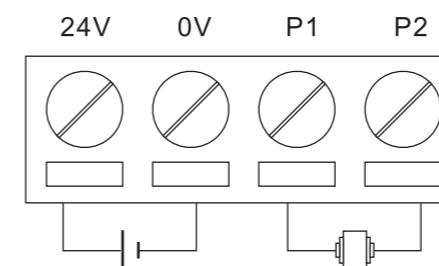
JLTCM 226A = 张力板 + 电位器 + 显示表头 + 开关

- \* 48\*48外壳，体积小，减少控制柜体积，节省安装人工，提高可靠性。
- \* 24V供电，多台可共用一个开关电源，连接器可插拔，接线更方便。
- \* 开关：触按旋钮后放开，显示灭，输出0电流。再按旋钮后放开返回原值。
- \* 限流：超过3.0A，自动保护。
- \* 百分比电压输出。

JLTCM226A=tension board+ potentiometer+display screen+switch

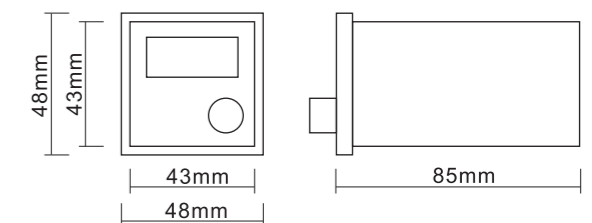
- \*48x48 shell, products occupies less space of the control screen, reduce the installation space.
- \*24V power supply, multiple tension controller share one switching power supply, convenient connection.
- \*exceed 30A, auto protect
- \*percentage voltage output

#### • 端子排接线 (Terminal connection diagram)



其中，(24V,0V) 接直流电源24V, (P1, P2) 接磁粉离合器  
(24V, 0V) connect 24DC power supply, (P1, P2) connect magnetic powder clutch.

#### • 外型尺寸 (Dimension)



面板尺寸宽\*高\*深 mm 48\*48\*85  
面板开孔参考尺寸 mm 43\*43

## JLTCM-226B 手动张力控制器

### JLTCM-226B MANUAL TENSION CONTROLLER

JLTCM 226B 是一款经济型小体积手动张力控制器，适合驱动扭矩10kgm以下的磁粉制动器/离合器，典型应用在电子材料贴片机或贴膜机、贴标机及印刷机排废张力控制上。

JLTCM226B Manual tension controller is adaptive to magnetic powder brake/clutch with driving torque less than 10kgm. It is widely applied in the sticking film machine, labeling machine and waste discharge of the printing machine.



#### • 功能特点 (Functions and features)

JLTCM 226B = 张力板 + 电位器 + 显示表头 + 开关

- \* 46\*61外壳，体积小，减少控制柜体积，节省安装人工，提高可靠性。
- \* 24V供电，多台可共用一个开关电源，连接器可插拔，接线更方便。
- \* 开关：触按旋钮后放开，显示灭，输出0电流。再按旋钮后放开返回原值。
- \* 限流：超过3.0A，自动保护。

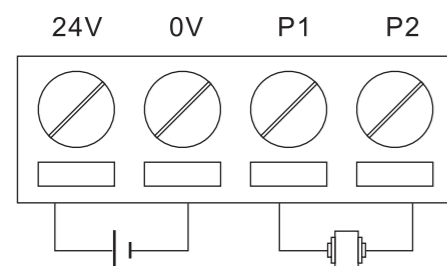
JLTCM226B=tension board+ potentiometer+display screen+switch

\*46x61 shell, products occupies less space of the control screen, reduce the installation space.

\*24V power supply, multiple tension controller share one switching power supply, convenient connection.

\*exceed 30A, auto protect

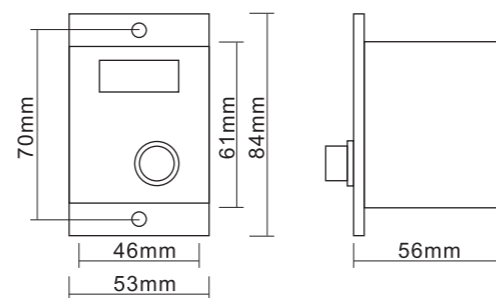
#### • 端子排接线 (Terminal connection diagram)



其中，(24V,0V) 接直流电源24V，(P1, P2) 接磁粉离合器

(24V, 0V) connect 24DC power supply, (P1, P2) connect magnetic powder clutch.

#### • 外型尺寸 (Dimension)



面板尺寸宽\*高\*深 mm 53\*84\*56

面板开孔参考尺寸 mm 46\*61

## JLTCM-226C 手动张力控制器

### JLTCM-226C MANUAL TENSION CONTROLLER

JLTCM 226C 是一款经济型小体积手动张力控制器，适合驱动扭矩10kgm以下的磁粉制动器/离合器，典型应用在电子材料贴片机或贴膜机、贴标机及印刷机排废张力控制上。

JLTCM226C Manual tension controller is adaptive to magnetic powder brake/clutch with driving torque less than 10kgm. It is widely applied in the sticking film machine, labeling machine and waste discharge of the printing machine.



#### • 功能特点 (Functions and features)

JLTCM 226C = 张力板 + 电位器 + 显示表头 + 开关

- \* 46\*61外壳，体积小，减少控制柜体积，节省安装人工，提高可靠性。
- \* 24V供电，多台可共用一个开关电源，连接器可插拔，接线更方便。
- \* 开关：触按旋钮后放开，显示灭，输出0电流。再按旋钮后放开返回原值。
- \* 限流：超过3.0A，自动保护。

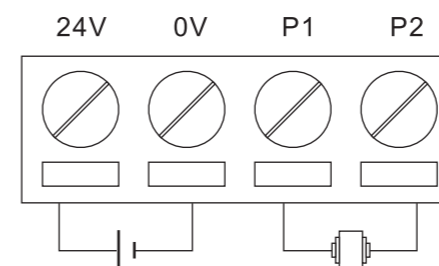
JLTCM226C=tension board+ potentiometer+display screen+switch

\*46x61 shell, products occupies less space of the control screen, reduce the installation space.

\*24V power supply, multiple tension controller share one switching power supply, convenient connection.

\*exceed 30A, auto protect

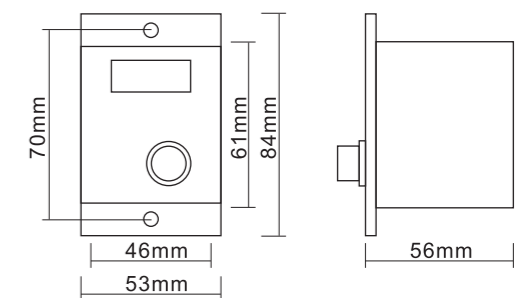
#### • 端子排接线 (Terminal connection diagram)



其中，(24V,0V) 接直流电源24V，(P1, P2) 接磁粉离合器

(24V, 0V) connect 24DC power supply, (P1, P2) connect magnetic powder clutch.

#### • 外型尺寸 (Dimension)



面板尺寸宽\*高\*深 mm 53\*84\*56

面板开孔参考尺寸 mm 46\*61



电脑检测线路板  
computer detects circuit board



全自动贴片机  
automatic placement machine



加工中心制作外壳  
machine center shell making



2017 龙游县通讯天线知识产权联盟副会长单位

2016 浙江省龙港市机械制造业协会会员单位

2014 龙游县电子信息产业协会副会长单位

2005 龙游县电子产业协会副会长单位

2003 评为浙江省高新技术产品

1998 产品通过省级鉴定

1986 公司创建

