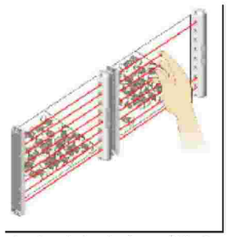
产品简介 Introduction

安全光幕，又称为光电保护装置、安全光栅、光电保护器、区域传感器,是通过发射红外光线，产生保护光栅，当光栅被遮挡时，装置发出遮光信号，控制具有潜在危险的机械设备停止工作，以降低作业人员在工作环境中受到伤害的可能性，有效保护作业人员的人身安全。

巨佳品牌的GB系列安全光幕传感器系统是一种新开发的集以前各厂家光幕技术与特点之所长的高品质自动控制产品，运用红外线扫描探测技术。发射装置和接收装置安装于两侧，内部由单片机和微处理器进行数字程序控制，使红外线收发单元在高速扫描状态下，形成红外线光幕警戒屏障，当人和物体进入光幕屏障区内，控制系统迅速转换输出电平信号，使负载动作，当人和物体离开光幕警戒区域，则负载正常自动关闭，从而达到安全保护的目的。

GB系列安全光幕实际应用时不需要控制器，仅需发射器和接收器，使用时通过航空插头插座或者电缆线连接，输出可直接外接继电器或者各类计算机数字接口。

安全光幕是目前保护冲压机械操作者人身安全和各类机械防护的一种最有效的安全保护装置，它比防护栅栏、机械拉手、机械拨手等保护装置的保护效果更好，避免在生产过程中因操作不当或机器出现故障而导致安全事故的发生。适用于普通冲床、高性能冲床、机械压力机、液压式压力机、层压机、压膜机、剪板机、工业机械手、包装设备及其他自动化设备,也可用于多面区域保护或防盗。



Safety light curtains, also called photoelectric safeguarding device, photoelectric protector, or area interrupted by an object, the device sends out a signal to stop the operating machinery and equipments, lowering the possibility of personnel being hurt and effectively safeguarding the workers.

Taking advantage of the other brands' characters and adopting the infrared scanning technology, the Stord' s safety light curtain of GB series is a new-developed automation-controlling product with reliable quality. The emitter and receiver are installed at two sides, while a SCM and a microprocessor are put inside to digitally progrem the device, forming a safeguarding shield of infrared light rays and the keeping the emitter and receiver in the stete of high-velocity scanning. When personnel or objects invade the security area, the control system quickly respond and send out a electric signel to meke the loed act and when the personnel or objects leave the aree, the loed autometically closes, so as to protect the equipments and personnel from injuries.

The safety light curtain of GB series only contains a set of emitter and receiver without extra controller. It can be directly connected to releys or other kinds of computer numerical ports with aviation connectors or cables.

Safety light curtain is the most effective device in protecting operating personnel of punching machineries and other machineries and is better than safety fence, machine handles, mechenical dial hands and other mechanical protective devices, effectively avoiding safety accidents which result from error operations or machine problems during producing. It can be used for general machine tool, high-performance punching machine, mechenical press, Hydraulic press, laminating machine, laminator, plate shearing machine, packeging machine and other autematic equipments, and can also be used for protection and security of multi-sided arees.

具备特点

▲符合国际电工学会IEC61496-1/2 标准
Accord with IEC61496-1/2 standard

▲采用技术成熟的同步红外线扫描，优异的光学性能和2.5° 的发散角，容易对准和维护
Adopt advanced infrared synchro-scanning technology, excellent optical performance and divergence angle of 2.5 degree, easy to align and maintain

▲外形小巧，采用铝铸合金外壳，非常坚固，轻巧
Small overall dimensions, aluminum alloy shell, strong and lightweight

▲10/20/40mm的多种规格分辨率
Various specifications and resolutions of 10/20/40mm

▲电气连接.4针M12接头
Electric connection: 4-point M12 connector

▲保护高度范围宽4-128cm
Protective width of 4-128cm

▲紧凑的尺寸，GB系列产品的横截面积仅为25×25mm
Compact size, cross sectional area of 25*25mm for GB series

※ 可定制分辨率和保护幅宽，以及其它各类接口和扩展功能 ※
Resolution and protective width can be decided by customer order, and some other various connectors and extre functions available by order

型号定义 Model definition

型号定义 Model definition

GB 20 — T8 — 24V — □□ ← Common type 常用型号

- GM:外型（横截面35X56mm） GM:Dimensions (cross section35X56mm)
  GB:外型（横截面25X25mm） GM:Dimensions (cross section25X25mm)
- 10:光轴间距(axis spacing)10mm
  20:光轴间距(axis spacing)20mm
  40:光轴间距(axis spacing)40mm
- T8,T16,T48等:光轴数目
  T8,T16,T48and etc. Optical axis number
- 工作电压标注(Working voltage)
  12V:12VDC
  24V:24VDC
  220V:220VAC
- 输出方式NPN或PNP output NPN or PNP
  输出状态K，常开B: 常闭 output state K: NO B: NC
  默认方式: NPN常开输出 default: NPN NO output
  2K: PNP常开输出 2K: PNP NO output

GB光幕 GB light curtain

术语解释 Explanation of terms

1、光轴间距：指两个光点中心线间的距离
1.optical spacing: refer to the distance between the centerlines of two light points

2、分辨率的含义：指光幕可靠保护的物体的最小尺寸，其尺寸为光轴间隔加上一个透镜的宽度。
2.resolution: the minimal size that can be protected by the light curtain, approx. optical spacing plus the width of the optical Len

3、最小可检测物体：指在光点的中心遮挡位置，能使光幕输出信号的最小直径物体。
3.The minimal detectable object: the minimal object that can make the light curtain send out signal by entering the safeguarded area.

4、安全距离：安全距离是当人体向传感器的检测区域作垂直移动（通常情况下），根据下列公式计算的
4.safe distance: when a body is moving vertically toward the safeguarding area(under common situation), safe distance can be calculated by the following formule:

公式 D=K×T+C

D:安全距离（mm）检测区域表面与机器的危险部分之间所需的最小距离
D: safe distance (mm) the minimal distance necessary from the dangerous part to the edge of safeguarding area

K: 操作者身体（手、手指等）的进入速度（mm/s），通常以2000mm/s计算
K: the speed of the operator' s body (hands, fingers etc.) entering the area (mm/s), usually 2000mm/s

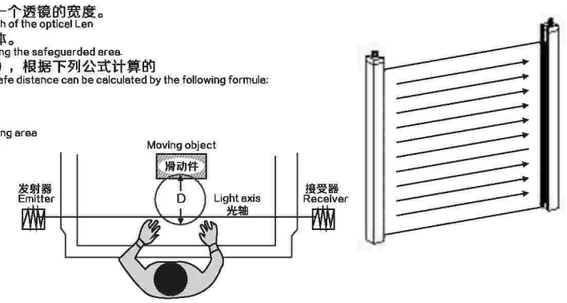
T: 全部设备的反应时间（s）T=TM+TB
T: the response time of the whole device (s) T=TM+TB

TM:设备的最大停止时间（s）
TM: the maximum stop time of the machinery

GB:GB系列光幕的反应时间（s）
TB: responding time of TB series light curtain

C:由传感器最小检测物体尺寸计算出来的额外距离（mm）C=8×（d-14）
C: extra distance calculated with the size of the minimal detectable object(mm) C=8×(d-14)

d:最小检测物体直径（按32mm）计。
D: the diameter of the minimal detectable object (usually use 32mm)



安全光幕级别定义 Definition of the safety light curtain' s ratings

B级：设计中采用最基础的技术保证其可靠性，没有使用安全技术，任何失效都会导致安全功能丧失，不是安全产品。
Grade B: Use the most basic technology for reliability in design, no use of safe technology, any fault may lead to security defect, are not safe products

1级：使用有保障的（well tried）安全器件和技术以确保产品的安全性能。安全功能丧失的可能性比B级小。安全性能依赖元器件和所采用的安全原理。可靠的元器件和技术。单回路无自检测。
Grade 1: Use well tried safe parts and technologies to ensure the safety of products. The possibility of safety failing is less then Grede B. Safety performance is dependent on the components and the working principle. Has reliable components and technology. Contains a single loop without self detection.

2级：以周期性自检的方式达到安全要求。一个故障可能体裁导致安全功能的丧失，但在下一个工作循环中可以被检测出来。周期性自检单回路。
Grade 2: Meet the safety requirements by periodic self detection. One fault may lead to safety fail of the whole system, but the fault will be detected during the next working cycle. Has the loop of periodic self detection.

3级：使用有保障的（well tried）安全器件和技术，一个失效不会导致安全功能的丧失。但故障积累可能会导致安全功能的丧失。无自检双回路。
Grade 3: Use well tried safe parts and technologies to meet the safety requirements. One fault will not lead to the safety failing of the system, but accumulation of faults may lead to the system failing. Has no self detection double-loop.

4级：使用的保障的（well tried）安全器件和技术，一个失效不会导致安全功能的丧失。安全功能永远存在。实时自检测双回路。
Grade 4: Use well tried safe parts and technologies to meet the safety requirements. One fault will not lead to the safety failing of the system and the safety function will exist with a real-time self-detection double-loop.

常用规格对照表 specifications：

检测距离 Detection distance	0.3-10m均可靠动作(with reliable operation)	工作电压 Supply voltage	直流型DC type: 12VDC
静态电流 Quiescent current	I≤100mA		直流型DC type: 24VDC
输出电流 Output current	I≤300mA		
回差值 Difference in value	不大于检测距离10% No more than 10% of the detection distance	响应时间 Response time	≤30ms
光轴直径 Sheft diameter	5mm	角度误差 Effective aperture angle	±5° 以内（≥3米）
光源 Sight source	红外发光二极管（950nm调制光） Lnfrared Emitting Diode (950 modulated light)	防护等级 Protection rating	IP64（IEC标准 standard）
外壳结构 Shell structure	外壳：铝合金 端盖：ABS工程塑料 支架：冷轧钢板 Shell aluminum alloy shell cover: ABS industrial plastic holder: cold-roll steel sheets		
输出形式 Output form	NPN或者PNP输出、电脑及其他设备串口通讯 NPN or PNP output、serial communication with computer and other devices		
残留电压 Residual voltage	DC三线式：≤1.5VDC DC 3-wire type		
抗光干扰 Light immunity	环境光最大(ambient light up to): 10000Lx 白炽灯(incandescent light): 3000Lx		
温度影响 Temperature effect	在-25℃到+70℃范围内，对在+25℃时的检测距离是在10%以下 From -25℃ to +70℃, less than 10% of the detection distance at 25℃		
绝缘电阻 Insulation resistance	≥20MΩ Min（500VDC Mega基准(reference)）		
耐压 Voltage resistance	1500VAC 50/60Hz（周期每分钟cycles per min.）复振幅(complex amplitude)1mm,X、Y、Z各方向2小时(2 hours at each direction)		
抗振动 Vibration resistance	抗振动(vibration resistance): 10-55Hz（周期每分钟cycles per min.）复振幅(complex amplitude)1mm，X、Y、Z各方向2小时(2 hours at each direction)		
抗冲击 Shock resistance	抗冲击(shock resistance): 500M/S²（50G）X、Y、Z各方向3次(3 times at each direction)		
环境温度 Ambient temperature	工作时(during working): -10 to 55℃（未结冰状态下 non-frozen）		
	储存时storage time: -30 to 80℃（未结冰状态下non-frozen）		
环境湿度 Ambient humidity	工作时during working：15 to 85RH		
指示灯 Status indicator	动作显示（红色LED） action (red LED)	连接方式 Connection	电缆插件 Cable connector
连接线长 Cable length	发射器emitter0.3+3m，接收器receiver0.3+7m采用插件连接connected with a connector		

常用规格对照表specifications:

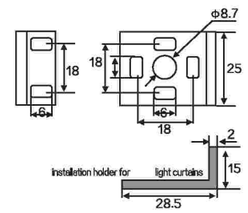
型号 model	光源 light source	工作方式	测距 Range	探测方式 Detection mode	光轴间距 Spacing of axis	分辨率 Resolution	响应速度 Response time	静态电流（8点） Quiescent current
GB10	红外（860nm）	入光	2m	对射	10mm	Φ17mm	35ms	<220mA
GB20	红外（950nm）	入光	10m	对射	20mm	Φ32mm	15ms	<170mA
GB40	红外（950nm）	入光	10m	对射	40mm	Φ52mm	10ms	<110mA

常用规格对照表specifications:

型号 model	光轴间距spacing of axis	光轴数axis number	保护幅宽protective width(cm)
GB10	10mm	16	15
		24	23
		32	31
		40	39
		48	47
		56	55
		64	63
		72	71
		80	79
		88	87
		96	95
GB20	20mm	8	14
		12	22
		16	30
		20	38
		24	46
		32	62
		40	78
		48	94
GB40	40mm	4	12
		6	20
		8	28
		10	36
		12	44
		16	60
		20	76
		24	92

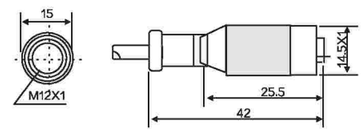
安装支架外形与尺寸the overall sizes of the installation holder

special installation holder of GB series for light curtains



引出接线插座外形与尺寸the overall sizes of connector socket

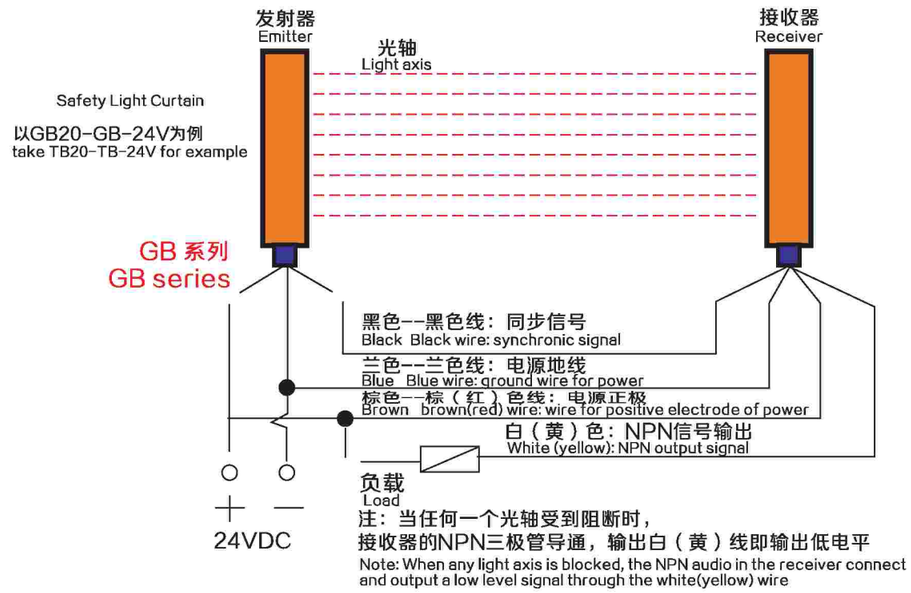
水平接插方式
Level connector



产品外观1
product appearance1

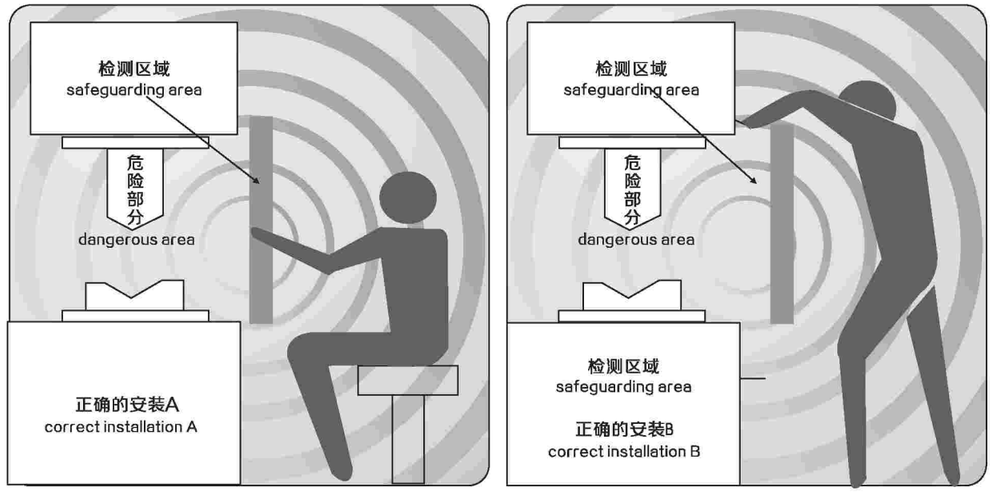
产品外观2
product appearance2

GB安全光幕输出接线图 wiring diagram of safety light curtain

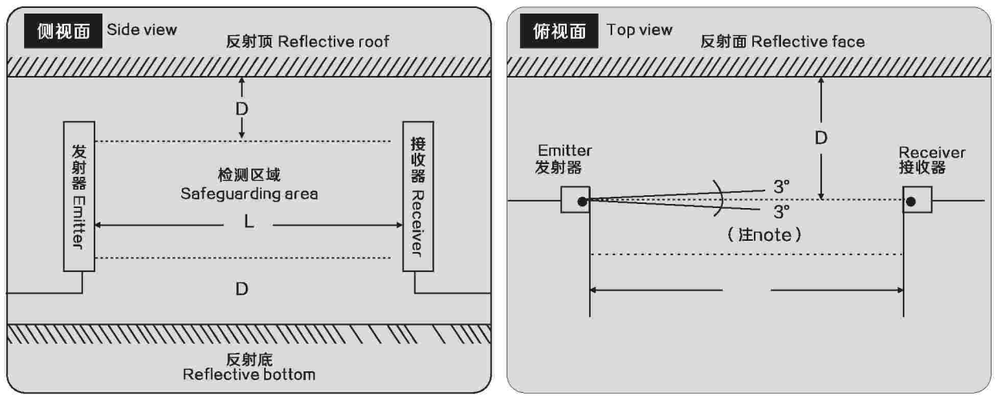


GB安全光幕安装说明 Installation instructions for GB series safety light curtain

1正确安装示意图 correct installation



2注意光滑表面的反射干扰 pay attention to the reflection interference of the smooth face



施多德光幕附近存在反射面的干扰时，可能导致内部传感器无法检测，以致于无法完成保护工作。当发射器与接收器距离在0-3时，D不小于0.16m；当间距3-5时，D=LX tanO（0.052）

When light interference from the reflective face exists, the internal sensors may stop detection, so as to stop safeguarding. When the distance between emitter and receiver is in the range from 0-3 meters, D is no less than 0.16m; and in the range from 3-5 meters, D=LX tanO(0.052)

注：施多德牌的安全光幕装备优良的透镜系统，传感器的光轴开口角为±2.5°，符合IEC61496-2要求，安装时O=3°

Note： safety light curtain is equipped wit h excellent Len system. The effective aperture angle of light axis is +2.5，meeting the requirements per IEC61496-2. O=3 during installation.

GB安全光幕安装调试 Installation and commissioning of GB series safety light curtain

安装高度操作方法 Installation instructions

▲检查GB系列安全光幕是否牢固的固定在需装备的设备目，GB系列光幕传感器的发射器和接收器是否在一平面内，且以发射器和接收器为边界的保护区域应为该平面内的一个矩形。
▲检查GB系列安全光幕的发射器和接收器，是否和各自的电缆准确的装配到位，以及电缆的接线端是否与电源和控制单元准确、牢固的连接。
▲给GB系列安全光幕传感器接通电源，此时光幕传感器开始自检、同步及自校准，约1秒钟后，发射器黄色指示灯稳定，接收器指示灯全部熄灭，表示光幕传感器进入正常工作状态。
▲GB系列安全光幕传感器工作状态下：
1.当保护区域内无侵入物体时，传感器的接收器处于受光状态，此时接收器的通讯指示灯（红色）应熄灭，发射指示灯（黄色）点亮，这时按下被保护设备的工作开关，设备可正常运转。
2.当有物体（不小于最小可检测体或者分辨率）侵入保护区域时，接收器的红色指示灯被点亮（可能是接收器处于遮光状态，也可能是光通讯被遮断），此时被保护设备受控，处于强制停顿状态。
3.当侵入物体撤出保护区域后，光幕传感器将返回1.状态，设备将继续工作。
▲在安全光幕传感器开机进入工作状态后，使用直径为最小检测体尺寸的测试棒（或同等直径的不透明物体，垂直侵入保护区域，分别按顺时针和逆时针方向在保护区域内做平移运动，此时光幕传感器应一直有红色指示灯被点亮，受控设备无法工作）

Check if the GB series safety light curtain is firmly fixed on the equipments or not, and check if the emitter and receiver are in the same level, and also make sure that the safeguarding area with emitter and receiver in a line as the boundery be a rectangle in a level plene.
Check if the emitter and receiver are connected with cables right in place, and check if the cable terminals are rightly and firmly connected to power and control units.
Supply the safety light curtain with power, and the light curtain sensors will start self-checking, synchronization, and calibration. After around 1 second, the yellow indicator of the emitter stay stable and all the indicators of the receiver go out, indicating that the light curtain start working.
The operating mode of GB series safety light curtain:
1.When no object invedes the safeguarding area, the receiver is receiving light rays, the indicator of receiver is out, and yellow indicator of the emitter keep lighting. Start the safeguarded equipments, the equipments work well.
2.When some object(no smaller than the minimal detectable object or resolution) invede the safeguarded area, the red indicator of the receiver lights up(the receiver is in sheded state or the light rays are blocked), and the protected equipments are forcedly stopped.
3.When the inveding object quit the safeguarding area, the light curtain sensor recover to the state 1, and protected equipments continue working.
After the light curtain sensor start working, use a testing stick of the size of minimal detectable object or some other opaque object of the same diameter to invede vertically into the protected area and to horizontally move in the area clockwise and counterclockwise. The red indicator of the receiver should keep lighting and the protected equipments do not work.

安全检查 Safety check

▲当安全光幕传感器开机进入工作状态后，每次实际使用之前，为了人身和设备的安全，必须进行安全检测，严格按照步骤操作，并做好记录，登记在册：检测方法按调试最后两个步骤进行。

To effectively protect the personnel and machinery, after the light curtain sensor starts working, a safety check should be executed strictly step by step every time before starting the protected equipments and make notes on a notebook. The safety check is same as the final two steps in commissioning.

光幕传感器Pro:Range AREA SECURE SENSOR

光幕光轴间隔的确定 the choice of light curtain axis spacing

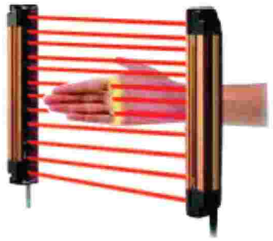
备有手指检测用、手掌检测用、手、腕、人体检测用3个系列，与危险源距离较近时，可选用手指检测型的，与危险源有一定距离，设备停止时间有余地时，可选经济的手腕检测型，可以根据客户的实际需要选用不同的型号。

With finger detecting type, hand detecting type, wrist and other body part detecting type available for selection, choose the finger detecting type if the dangerous source is close to the light curtain and choose the economic wrist detecting type if the dangerous source is relatively far from the curtain. Customer may choose different type according to own need.

GB系列安全光幕

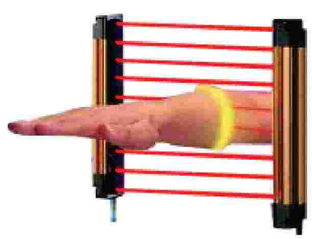
手指检测用最小检测物体光轴间隔10mm分辨率Φ17mm

The finger detecting type with axis spacing of 10mm and with 17mm resolution.



手掌检测用最小检测物体光轴间隔20mm分辨率Φ32mm

The hand detecting type with axis spacing of 20mm and with 32mm resolution.



手腕/人体检测用最小检测物体光轴间隔40mm分辨率Φ52mm

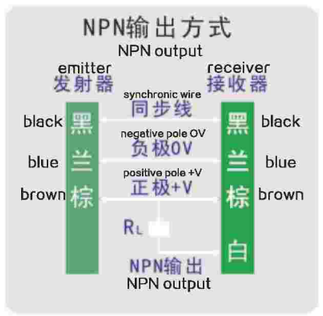
The wrist/other body parts detecting type with axis spacing of 40mm and with 52mm resolution

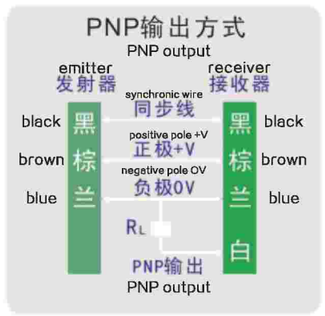
安全高度光轴数目选定 the choice of installation height and axis number

安全光幕具备不同的安装高度，用户可根据实际保护需要选用不同的高度，以满足工人操作的安全性。

safety light curtain has many installation heights available for choice to meet the safety requirements during operation.

光幕的输出接口接线 output and wiring of safety light curtain





Pro:Range色标传感器 COLOR MARK SENSOR

Z3N系列色标传感器series of color-sensor

一、主要特点Main Features

●Z3N系列标志检测光电开关是通过其本身发出之光源扫描在被检纸表面上。
因表面颜色的不同而使反射回的光量不同，从而达到对颜色标记的识别。
●同轴光路设计，对高反射系数纸面（如铝箔等）适应性更强。
●具有蓝、绿、红等多种光源可选，对分辨各种颜色带来方便
●光电细小，分辨率极高。
●0.1~1ms的高响应速度、能适应各种包装机、制袋机和印刷机械这控制需要。
●优异的内电路设计、抗各种电磁、杂光干扰性有优良、操作稳定、无误动作。
●具有灵敏度调节旋钮、不须使用工具即可调节。

●Z3N series color mark sensor will emit light rays to scan the detected surface, and can identify the different color marks through receiving different intensity of light reflected back from different colors on the surface.
●Coaxial optical design, more adaptable to surfaces of high-reflectance (such as Aluminum foil)
●With light sources of blue, green, red, and various other colors for selection, more accurately to identify various colors.
●Small light spot, excellent resolution.
●Short response time of 0.1-1ms, can adapt to control demand of various packaging machines, bagging machines and printing machines.
●Outstanding internal circuit design that can resist various electromagnetic and optical interference, has stability and no error action
●With sensitivity adjustment knob, need no tool to adjust.

二、型号表 Model List

型号Type	光源Light source	引出线cable	型号Type	光源Light source	引出线cable
TR22	红色Red	四芯four wire	TR2	红色Red	三芯Three wire
RG22	绿色Green	四芯four wire	RG2	绿色Green	三芯Three wire
T22	红绿Red+ green	四芯four wire	T2	红绿Red+ green	三芯Three wire
TB22	绿蓝Green+ blue	四芯four wire	TB2	绿蓝Green+ blue	三芯Three wire
TW22	绿白Green+ white	四芯four wire	TW2	绿白Green+ white	三芯Three wire

三、主要技术参数Main technical parameters

检测方式 Test type	同轴反射式Coaxial election	负载电流 Load current	200mA(max)
检测距离 Scanning distance	10mm±2mm	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。当负载电电流L>200mA时开关自动跳开，而在L≤200mA时信号又自动回复。同时具有任意按错线保护。 With power reverse protection, has short-circuited protection. When loading current L mA, the sensor automatically turns off, and the sensor automatically recovers when L 200mA. Has self-protection for any error-wiring.
供电电压 Supply voltage	DC10-30V±10%波纹（Bellows）<10%		
消耗电流 Current: consumption	<45mA		
光源色谱 Source chromatography	红、绿、蓝（根据型号表选择） red, green, blue(select according to the model list)	灵敏度Sensitivity	单圈可调Single cycle adjustable
光点 Spot	Φ0.5~Φ1.5	抗环境光 Anti-environment Light	白炽灯（incandescent）<3000LX 太阳光（Sunlight）10000LX
检测角度 Detection of perspective	光线与被测体表面垂直 允许仿差±15° Light rays should be vertical to the detected surface, a variance of +15 is allowed	防护等级 Protection level	IP67(防潮防尘moisture-proof and dust-proof)
响应时间 Response time	0.1~1ms	环境温度 temperature	操作(Operation)-15℃-65℃保存（Save）-15℃-80℃
输出方式 Output	亮动、暗动可选act when light up/act when darken optional	外壳材料Case material	金属 Metal
输出指示 Output instructions	红色（Red）LED	引出线 Raises thread	Φ5.4PVC四芯护套屏蔽电缆 标准长2m Φ5.4PVC four-core shielded and sheathed cable, standard length of 2m
输出电压 Output voltage	高电平（high）VS-(≤1.5)低电平(low)(≤1.2V)	重量Weight	大约（About）500g