



Laser Sensor / Photo Sensor / Proximity Switch / Solid State Relay
Integrated Industrial Automation
Products Manufacturer

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■ 概述 Application

激光传感器是由激光器, 激光检测器和测量电路组成。激光传感器是新型测量仪表, 它的优点是能实现无接触远距离测量, 速度快, 精度高, 量程大, 抗光, 电子干扰的能力强等。激光通过调整感应距离, 可进行准确感应工作, 感应工作最小 2cm-- 最大 40cm, 检测距离, 能测透 0.1mm 的微小物体。能增加光点能见度, 可在 40cm 光点并能进行简易调整, 调节更方便。激光传感器可适当在灰尘环境中使用, 需定期清理透镜, 红色激光束可在目标位置上整齐排列。

Laser sensor consists of laser, laser detector and measurement circuit. It is a new measuring instrument, Its advantage is to achieve non-contact distance measurement, fast speed, high precision, large range, strong ability for light resistance and electronic interference.

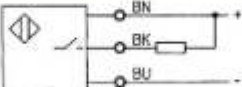
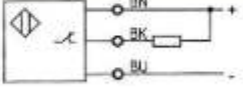
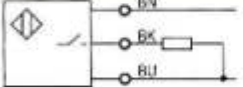
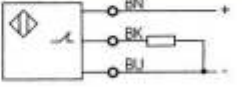
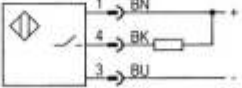
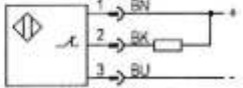
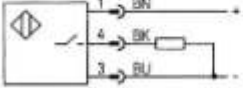
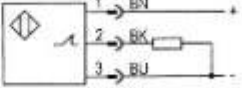
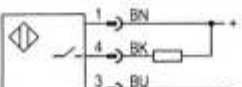
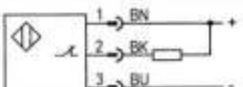
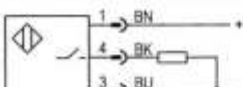
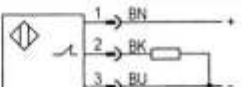
Laser can induct work accurately by adjusting the induction distance, minimum induction work is 2cm, max is 40cm. Detect distance , could detect 0.1mm of tiny objects, can add light visibility, can perform simple adjustment at 40cm spot, more convenient adjustment. Laser can be used in dusty environment, must clean the lens regularly, red laser beams can be lined up on the target location.



■ 技术参数 Parameter

感应方式 Induction way		标准感应型 Standard induction type
型号 Model	NPN 常开 NO	EL18-D1T40NA
	PNP 常开 NC	EL18-D1T40PA
	NPN 常闭 NC	EL18-D1T40NB
	PNP 常闭 NC	EL18-D1T40PB
感应距离 Induction distance		40cm(白纸 100mmx100mm) 40cm(white paper 100mmx10mm)
光点直径 Spot size		25cm 处 0.5mm 0.5mm at 25cm
标准感应物 Standard inductor		30cm 处直径大于 0.5mm More than 0.5mm at 30cm
最小检测物体 Minimum detected object		30cm 远处直径 0.5mm 的不锈钢销规 Φ0.5mm stainless steel pin gauge at 30cm distance
黑白误差 Black and white error		30cm 处 10% 10% at 30cm
光源 (发光波长) Light source		红色 LD650nm, JIS 等级 1, IEC 等级 1 Red LD(650nm), JIS grade 1, IEC grade 1
电源电压 Supply voltage		DC10~30V ± 10% 脉动 (p-p) 10% 以下 DC10~30V ± 10%, pulse (p-p) <10%
消耗电流 Consumption current		30mA 以下 <30mA
控制输出 Control output		负载电源电压 DC26.4V 以下, 负载电流 200mA 以下, 开路集电极输出 Load supply voltage < DC26.4V, load current < 200mA, open collector output
残余输出电压 Rest output voltage		负载电流低于 10mA 时: 1V 以下 负载电流为 10~200mA 时: 2.7V 以下 Load current < 10mA: <1V Load current is 10~200mA: <2.7v
保护电路 Protection circuit		电源逆接保护, 输出稳压保护 Power supply reverse connect protection, output voltage protection
响应时间 Response time		动作或复位: 0.5ms 以下 Action or reset : <0.5ms
灵敏度调节 Sensitivity adjustor		旋转调节器 Rotate regulator
周围温度 Ambient temperature		动作时: -10~+55℃, 保存时: 25~+70℃ (不结冰, 结露) Action: -10~+55℃, storage: -25~+70℃ (no-icing, condensation)
连接方法 Connection way		预先配线型标准 2 米 With standard 2meters
显示灯 Display lamp		动作显示红色 LED Action display red LED

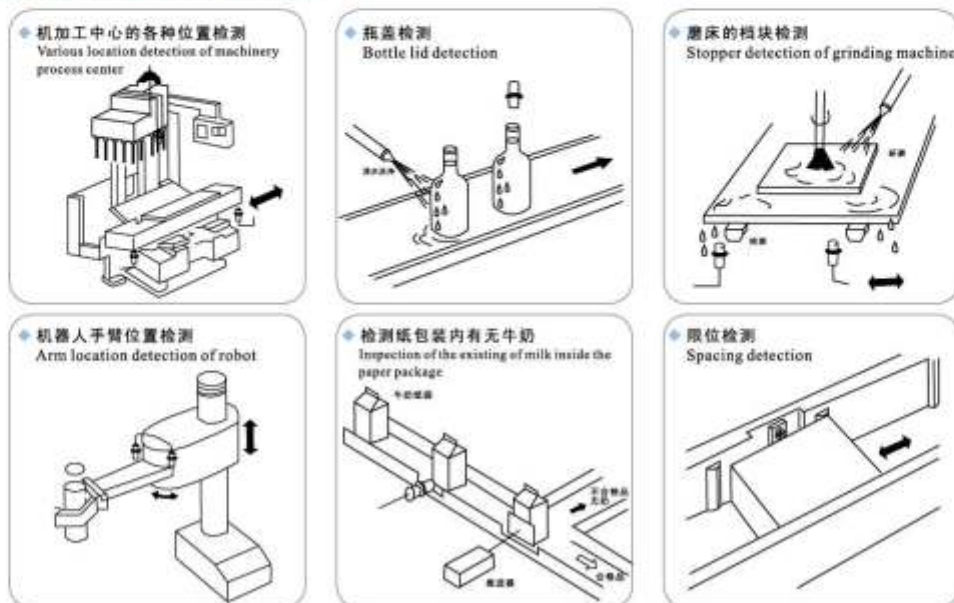
■ 连接方式 Connection Mode

DC 3 线 -Wire	NPN NO	NPN NC	PNP NO	PNP NC
引线式 Leaded				
M8 连接器 M8 Connector				
M12 连接器 M12 Connector				

■ 光电开关型号构成及含义 Model composition and definition of infrared ray laser sensor.

EL	18	-	3	A	40	N	A	□
1	2	-	3	4	5	6	7	8

编号 N.o	构成 Composition	代码及含义 Code and definition
1	基本形式 Basic form	EL: 激光传感器 Laser sensor
2	外形编号 Outward appearance code	18, 50, 76……
3	工作电压 Working voltage	2: 90~250VAC 3: 10~30VDC 4: 12~240VDC/24~240VAC 5: 特殊电压 Special voltage
4	检测方式 Detection way	A: 漫反射型 (扩散反射型) B: 反馈反射型 (镜面反射型) C: 透过型 (对射型) D: 标记检测型 G: 光纤型 E: 槽型 A: diffused reflection type (scattered reflection type) B: feedback reflection type mirror (mirror reflection type) C: penetration type (correlation type) D: marking detection type G: optical fiber type
5	检测距离 Detection distance	05: 5cm 10: 10cm 30: 30cm 40: 40cm 101: 10m
6	输出形式 Output form	N: NPN 直流负逻辑输出 P: PNP 直流正逻辑输出 J: 继电器触点输出 L: 交流二线输出 S: 具备 NPN 和 PNP 二种输出 N: NPN transistor output P: PNP transistor output J: Relay contact output L: AC two-wire output S: with two outputs: NPN and PNP
7	输出状态 Output state	A: 常开 (入光 NO) B: 常闭 (遮光 NC) C: 一开一闭 Z: 常开常闭可逆 A: Normally open (light entering NO) B: Normally close (light sheltering NC) C: normally open+normally close
8	附属功能 Subsidiary	T1: 前延时 front delay T2: 后延时 rear delay Y: 防油型 T: 带航空插件 with aviation connector I: 特殊要求 special requirement

■ 激光传感器应用图例
Application illustration of laser sensor


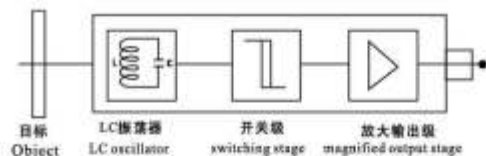
■ 接近开关型号说明 Model explanation of proximity switch

L M 18 - 30 05 N A □ / L
1 2 3 4 5 6 7 8

编 号 N.o	构成 Composition	代码及含义 Code and definition
1	开关类别 Switch category	LM: 电感式 inductance type CM: 电容式 capacitance type SM: 霍尔式 Hall type AM: 安全防爆式 safety explosion-proof type XM: 模拟线性式 mimic linear type HM: 舌簧式 reed type
2	外形代号 Outward appearance code	□: 圆柱型 Cylinder type F: 角柱型及平面安装型 Angular column type and plane installation type
3	工作电压 Working voltage	30:6-36VDC 310:5-24VDC 320:12-60VDC 330:10-30VDC 340:10-55VDC 350:10-60VDC 360:5-36VDC 20:90-250VAC 210:24-250VAC 220:380VAC 40:12-240VDC/24-240AC 50: 特殊电压: Special voltage
4	检测距离 Detection distance	01:1mm 05:5mm 10:10mm
5	输出形式 Output form	N: 三线直流 NPN 负逻辑 输出 three-wire DC NPN output P: 三线直流 PNP 正逻辑 输出 three-wire DC PNP output L: 二线直流输出 two-wire DC output □: 交流二线输出 AC two-wire output J: 继电器触点输出 Relay contact output NP:NPN+PNP 双输出 NPN+PNP double output
6	输出状态 Output state	A: 常开 (NO) Normally open(NO) B: 常闭 (NC) Normally close (NC) C: 一开一闭 (NO+NC) normally open+normally close(NO+NC) MU: 模拟电压 Mimic voltage MI 模拟电流 Mimic current
7	附属功能 Subsidiary functions	T: 带航空插座 with aviation connector Y: 防水、防油 water proof,oil proof I: 特殊要求 special requirement H: 耐高温 high temp resistance R: 环型 ring type
8	远距离 Long-distance	L: 远距离型 Long-distance

■ 电感式接近开关工作原理

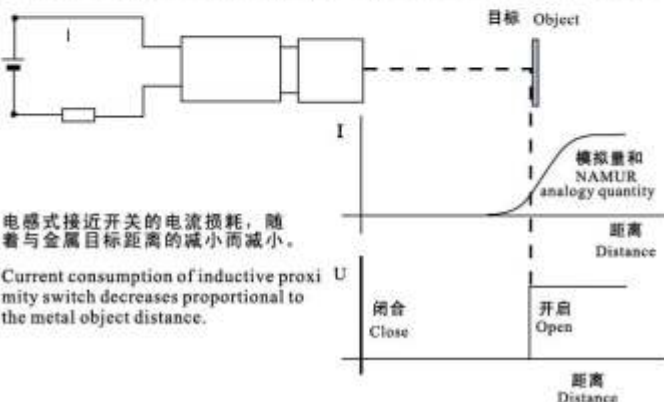
Working principle inductive of proximity switch



电感式接近开关由三大部分组成: 振荡器、开关电路及放大输出电路。振荡器产生一个交变磁场。当金属目标接近这一磁场, 并达到感应距离时, 在金属目标内产生涡流, 从而导致振荡衰减, 以至停振。振荡器振荡及停振的变化被后级放大电路处理并转换成开关信号, 触发驱动控制器件, 从而达到非接触式之检测目的。

目标离传感器越近, 线圈内的阻尼就越大, 阻尼越大, 传感器振荡器的电流越小。

Inductive proximity switch is composed of three parts: oscillator, switch circuit and magnified output circuit. The oscillator will generate an alternating electric field. When hemetal object approaches this electric field and reaches the induction distance, whirlpool will generate in metal object, resulting in attenuation of vibrati on and then stop. The changeof vibration and stop of oscillator is treated by behind stage magnified circuit and convertedto switching sign, triggering driving control for non-contact detection.



■ 接近开关应用图例

Application illustration of proximity switch

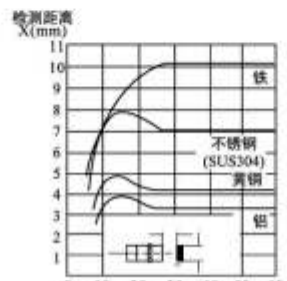
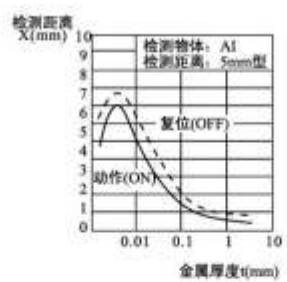
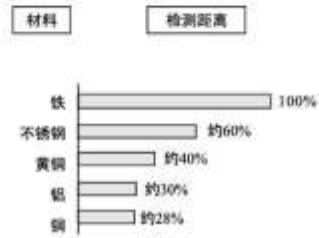


■ 接近开关的特性 Features of proximity switch

◆ 主要特性 Main features

以高频振荡型接近传感器(前面检测器)为代表例,概略说明接近传感器的一般特性。

Take high frequency oscillation type proximity sensor(front detector)as representative example to briefly explain general features of proximity switch

项目 Item	说明 Explanation	特性 Features
检测物体的大小和检测距离 The size of detected object and detection distance	○ 检测物体为正方形金属板,厚度恒定($t = 1\text{mm}$),改变其边长$d\text{mm}$时的检测距离X进行测定。 If the detected object is square metal sheet with constant thickness($t = 1\text{mm}$), detect at detection distance X when change its side length $d\text{mm}$. 	- 检测物体为大于标准检测物体时,检测距离基本上恒定。 - 根据机种的不同,有时和左边特性不同。 - 贯通型等,以圆柱状金属棒为检测物体。 - When the detected object is bigger than standard detected object, on the main, the detection distance is constant. - According to different machine type, sometimes the features will be different with that mentioned on the left. - To through type, the detection object is like cylinder metal bar.
检测物体的厚度和检测距离 The thickness of detected object and detection distance	测定改变指定的标准检测物体形状的厚1mm时的检测距离$X\text{mm}$(前面检测型) Detect at detection distance $X\text{mm}$(front detector) when change the thickness of the assigned standard detected object 1mm. 	- 磁性金属(铁等)时,厚度在1mm以上时,检测距离基本上没有变化。 - For more than 1mm thick magnetic metal like iron, on the main, the detection distance will not change.
检测物体材料和镀层等造成的影响 The effects resulted from the thickness of detected object and cladding material	标准检测物体的由于形状、尺寸因具材料。或各种镀引起的影响,用检测距离$X\text{mm}$的测定加以确认。 Because the detection to standard detected object will be effected by its shape, size, material, and various cladding material, confirm through detection distance $X\text{mm}$ measurement. 	- 铁以外的金属造成的检测距离及镀层的影响,根据不同的机种而不同。 - 检测所有金属的机种时,基本上不受镀层的影响。 - The effects resulted from detection distance and cladding material of the metal exclude-iron will be different according to different machine type. - On the main, the machine type which detects all the metals will not be effected by cladding material.

◆ 关于检测物体 About detected object

- 检测物体的材料是非磁性金属时,动作的距离要下降。但厚度为大于0.01mm左右的箔材料时,会获得和磁性物体相同的检测距离,而镀膜等级其薄时及无导电性时,则不能检测。
- 镀层的影响检测物体具有镀层时,请注意其检测距离就变了。
- When the material of detected object is non magnetic metal, the distance of action should decrease. But when the foil material is approximately thicker than a. 01mm, the detection distance will be the same as that of magnetic object. If the film plating is extremely thin or non-conductive, detection cannot be conducted.
- The effect of cladding material, When detected object has cladding material, take note of the changing of detection distance.

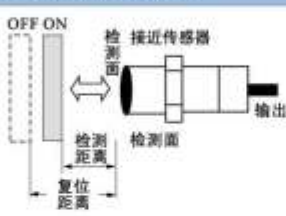
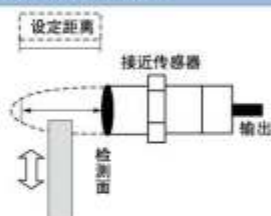
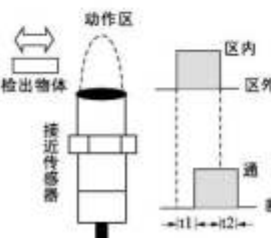
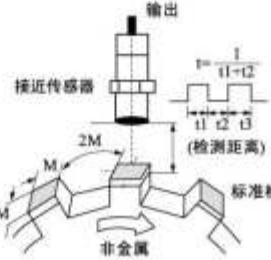
◆ 关于环境气候 About ambient weather

- 为保护动作的可靠和寿命长,请避免在有关规定以外的温度外界(户外)条件下使用,接近传感器虽为防水结构,若装上罩使用,勿使水和水溶性切削油等淋到,则可更好地提高可靠性及寿命。还请在避免在有化学药剂,特别是在强碱、酸、硝酸、铬酸、热浓硫酸等气候中使用。
- In order to maintain reliable action and long service life, please avoid the(outdoor) occasion beyond the stipulated ambient temperature. Do not drench it with water or water-soluble cutting lubricant when it is used with cover, although the proximity sensor is waterproof. Do not use in the occasions with chemical agents, especially strong base, acid, nitric acid, hot strong sulfuric acid and so on.

◆ 关于维护检修 About maintenance and overhaul

- 为使接近传感器长期稳定工作,和一般的控制器一样请进行下列定期检查。
- 1. 被检测物体及接近传感器的安装位置,偏移,松动,变形的有无。
- 2. 配线,连接部位有无松动,接触,不良,断线。
- 3. 有无附粘金属粉末等积物。
- 4. 使用温度条件,周围环境条件有无异常。
- 5. 检测距离有无异常。
- In order to keep the proximity sensor to work stably for long time, the following regular examinations should be performed just like general control.
- 1. Check the installation position of detected object and proximity sensor if any deviation, loosening or deformation exists.
- 2. Check the attached wires and connecting parts if any loosening, bad contact or wire breaking off exists.
- 3. Check if there is any metallic powder accumulation or not.
- 4. Check if the temperature condition and surrounding environment condition are normal or not.
- 5. Check if the detection distance is normal or not.

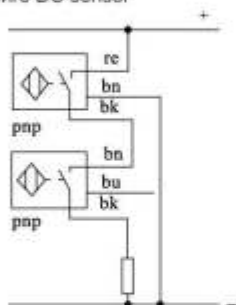
■ 技术用词的说明 Explanation of technical terms

检测距离 Detection distance	设定距离 Setting distance	标准检测物体 Standard detected object
 - 按指定方法移动检测物体，从基准位置（基准面到测定动作复位）的距离 - Move the detected object according to assigned method, the distance from the reference position (reference plane) to the detecting action (resetting)	 - 包括温度、电压影响在内，没有误动作从能实用的检测面到检测物体通过位置的距离。 - Including the effects like temperature and voltage, without error action, the distance passed through from the practical detection surface to the objected object.	 - 为测定基本性能作为标准的检测物体，形状、尺寸、材料已决定的 - Take as standard detected object to detect the basic performance. The shape, size and material have been determined.
差动距离 Differential distance	响应时间 Response time	响应频率 Response frequency
 - 到动作的距离和到复位的距离之差的绝对值。 - The absolute value of the distance difference between the distance to action and the distance to resetting	 T1: 检测物体进入动作区内，从接近传感器成为动作状态到出现输出的时间。 t2: 从离开动作区到输出消失为止的时间。 T1: when the objected object enters the action zone, the time from proximity sensor being in action state to output appearance. T2: The time from leaving action zone to output disappearance.	 反复接近检测物体时，能得出跟踪它的输出的每秒次数。 测定方法概略如上图。 • Work out the tracking output times per second by repeatedly approaching the detected object. • Brief detection method sees the above diagram.

■ 串联、并联 Series connection and parallel connection

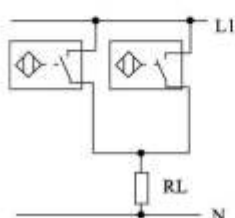
◆ 三线直流与三线直流传感器的串联

Series connection of three-wire DC and three-wire DC sensor



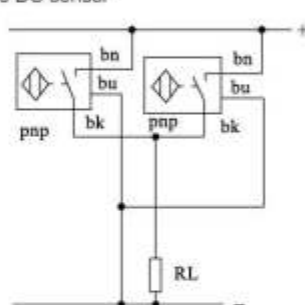
◆ 两线交流传感器的并联

Parallel connection of two-wire AC sensor



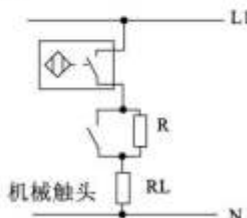
◆ 三线直流与三线直流传感器的并联

Parallel connection of three-wire DC and three-wire DC sensor



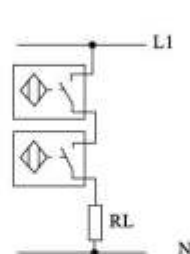
◆ 机械开关与交流传感器的串联

Series connection of machinery switch and AC sensor



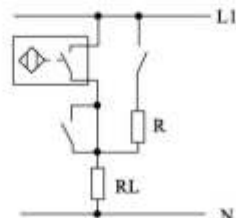
◆ 两线交流传感器的串联

Series connection of two-wire AC sensor



◆ 机械开关与交流传感器的并联

Parallel connection of machinery switch and AC sensor

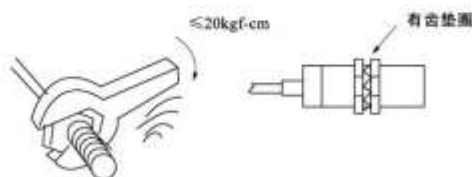


主要特征 Main features

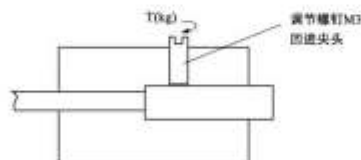
- ◆ 体积小 Compact volume
- ◆ 重复定位精度高 High precision of repeated location
- ◆ 外形结构多样 Diversified exterior structures
- ◆ 抗干扰性能好 Good performance of anti-interference
- ◆ 输出形式多 Many output forms
- ◆ 开关频率高 High on-off frequency
- ◆ 电压范围宽 Wide voltage range
- ◆ 防尘、防震、防水、防油 Dust proof, vibration proof, water proof and oil proof
- ◆ 具备短路保护, 反连接保护 with short-circuit protection and inverted connecting protection
- ◆ 使用寿命长 Long service life

正确使用和安装及注意事项 Correct use, installation and cautions

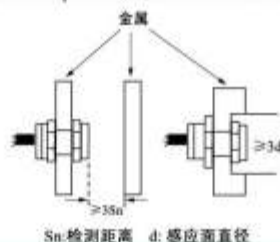
- ◆ 螺纹式开关的安装 Mounting screw switch
- ◆ 安装开关时不可采用大力距紧固, 紧固时请务必采用齿垫圈
- ◆ Do not tighten with over-torque when mounting the switch. Adopt toothed washer when tightening



- ◆ 无螺纹式柱型开关的安装 Mounting non screw type pillar switch
- ◆ 采用调节螺钉时, 紧固力矩请用 2~4kgf-cm 以下安装;
- ◆ When adopt adjusting screw, the tightening torque should be within 2~4kgf-cm.

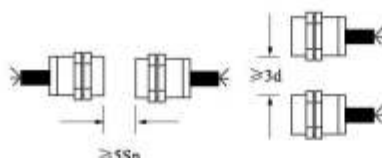


- ◆ 防止非检测物体的干扰 Protection against the interference of non detected object in金属件上安装接近开关时, 请务必参照下图, 所示预留一定空间, 以避免开关产生误动作
- ◆ When mounting the proximity switch on the metal part, do refer to the following diagram. Remain a certain space in advance according to the shown diagram so as to prevent the switch from error action.



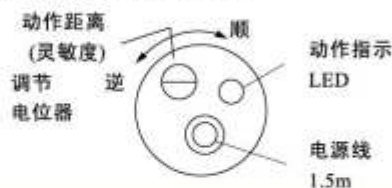
Sn:检测距离 d:感应面直径

- ◆ 防止开关之间的相互干扰 Protection against mutual interference between switches
- ◆ 当开关对置或并列安装时, 请大于下图的尺寸按装, 以免相互干扰而产生误动作;
- ◆ Mount according to the size which is bigger than that in the following diagram to prevent the switch from error action resulted from mutual in interference if mount the switches contra-positively or in parallel.

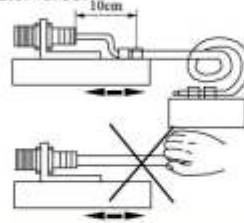


Sn:检测距离 d:感应面直径

- ◆ 开关动作距离(灵敏度)可调节 Adjustable switch action distance (sensitivity)
- ◆ 接近开关可通过微调电位器调节动作距离(灵敏度)。顺时针动作距离增大(灵敏度减低), 逆时针, 反之, 切忌在动作距离最大临界状态下使用。
- ◆ The action distance (sensitivity) of proximity switch can be adjusted by the means of trimming potentiometer. Increase the action distance and reduce sensitivity when turn clockwise. Vice versa. Do not use in the critical state of max. action distance.



- ◆ 开关引线的防护 Guard of switch lead-wire
- ◆ 按装开关时, 请将离开关 10cm 左右引线位置用线夹固定, 防止开关引线受外力的作用损坏。
- ◆ When mount switch, fix the lead-wire at a distance about 10cm from the switch with wire clip so as to prevent the switch lead-wire from damage from outer force.

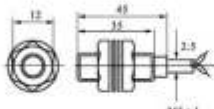
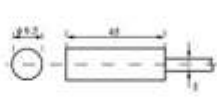
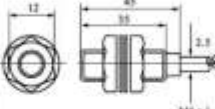
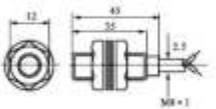


注意事项 Cautions

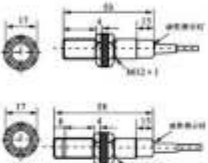
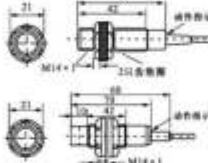
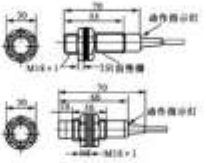
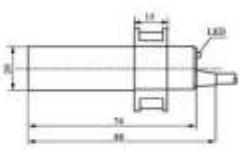
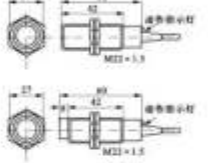
- ◆ 直流开关应使用绝缘变压器, 并确保稳压电源纹波
- ◆ 如有电力线动力线通过开关引线周围时, 防止开关损坏或误动作, 将金属管套在开关引线上并接地。
- ◆ 开关使用距离请设定在额定距离以内, 以免受温度和电压影响。
- ◆ 严禁通电接线, 应严格按接线图输出回路原理图接线。
- ◆ 用户如需要防水、防油、耐酸、碱、耐高温开关等特殊要求或其他规格应在订货时说明, 并给于定做。
- ◆ DC switch should adopt insulation transformer and ensure stable voltage mains corrugation.
- ◆ If any electric power line or dynamic line passes through the surrounding of switch leadwire, in order to prevent the switch from damage or error action, cover the metal bushing on the switch lead-wire and ground it to the earth.
- ◆ Set the switch use distance within the rated distance to avoid the effects from temperature and voltage.
- ◆ Wiring while power-on is strictly prohibited. Connecting the wires strictly according to the wiring diagram and output return elementary diagram.
- ◆ If there are any special requirements to the switch like water proof, oil proof, acid proof, base proof, high temperature proof or with any other specifications, the users are required to give clear indication when placing an order. We can produce according to the requirements of the user.

- 结构分类：圆柱型
Structural category: Cylinder type
- 外形图例
Outward appearance illustration



外形编号 Outward appearance code				LM5	LM6	LM06	LM8
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance			1mm	1mm	1mm	1mm
	直流 DC 6~36 VDC	NPN	NO	LM5-3001PA	LM6-3001NA	LM06-3001NA	LM8-3001NA
			NC		LM6-3001NB		LM8-3001NB
			NO+NC				
		PNP	NO	LM5-3001PA	LM6-3001PA	LM06-3001PA	LM8-3001PA
			NC		LM6-3001PB		LM8-3001PB
			NO+NC				
	交流 AC 90~250 VAC	二线制 two wire system			LM6-3001LA LM6-3001LB		LM8-3001LA LM8-3001LB
		SCR 可控硅 Control- lable silicon	NO				
			NC				
				NO+NC			
继电器输出 Relay output							
非埋入式 Non-flush	检测距离 Detection distance				1.5mm		2mm
	直流 DC 6~36 VDC	NPN	NO		LM6-3002NA		LM8-3002NA
			NC		LM6-3002NB		LM8-3002NB
			NO+NC				
		PNP	NO		LM6-3002PA		LM8-3002PA
			NC		LM6-3002PB		LM8-3002PB
			NO+NC				
	交流 AC 90~250 VAC	二线制 two wire system			LM6-3002LA LM6-3002LB		LM8-3002LA LM8-3002LB
		SCR 可控硅 Control- lable silicon	NO				LM8-2002A
			NC				LM8-2002B
				NO+NC			
继电器输出 Relay output							
输出电流 Out-put current		DC	100mA	150mA	100mA	150mA	
		SCR/ 继电器 Relay				150mA	
输出电压降 Output voltage drop		DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
消耗电流 Consumption current			直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
标准检测物体 Standard detected object			6×6×1(A3 铁 iron)	8×8×1(A3 铁 iron)	8×8×1(A3 铁 iron)	8×8×1(A3 铁 iron)	
重复精度 Repeated precision			0.01	0.01	0.01	0.01	
响应频率 DC/AC Response frequency			500Hz	500Hz	500Hz	500Hz/25Hz	
工作环境温度 Working environment temperature			-25℃ ~+70℃	-25℃ ~+75℃	-25℃ ~+70℃	-25℃ ~+75℃	
绝缘电阻 Insulation resistance			≥ 50MΩ	≥ 30MΩ	≥ 50MΩ	≥ 50MΩ	
外壳材料 Shell material			金属 Metal	不锈钢 Stainless steel	金属 Metal	金属 Metal	
防护等级 Protection grade			IP67	IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad						E2E-X1R5 □□	



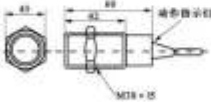
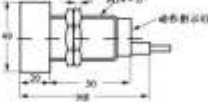
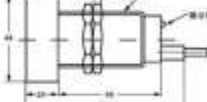
LM12	LM14	LM18	LM20	LM22
				
2mm	3mm	5mm		7mm
LM12-3002NA	LM14-3003NA	LM18-3005NA		LM22-3007NA
LM12-3002NB	LM14-3003NB	LM18-3005NB		LM22-3007NB
LM12-3002NC	LM14-3003NC	LM18-3005NC		LM22-3007NC
LM12-3002PA	LM14-3003PA	LM18-3005PA		LM22-3007PA
LM12-3002PB	LM14-3003PB	LM18-3005PB		LM22-3007PB
LM12-3002PC	LM14-3003PC	LM18-3005PC		LM22-3007PC
LM12-3002LA	LM14-3003LA	LM18-3005LA		LM22-3007LA
LM12-3002LB	LM14-3003LB	LM18-3005LB		LM22-3007LB
LM12-2002A	LM14-2003A	LM18-2005A		LM22-2007A
LM12-2002B	LM14-2003B	LM18-2005B		LM22-2007B
		LM18-2005C		LM22-2007C
4mm	5mm	8mm	10mm	10mm
LM12-3004NA	LM14-3005NA	LM18-3008NA	LM20-3010NA	LM22-3010NA
LM12-3004NB	LM14-3005NB	LM18-3008NB	LM20-3010NB	LM22-3010NB
LM12-3004NC	LM14-3005NC	LM18-3008NC	LM20-3010NC	LM22-3010NC
LM12-3004PA	LM14-3005PA	LM18-3008PA	LM20-3010PA	LM22-3010PA
LM12-3004PB	LM14-3005PB	LM18-3008PB	LM20-3010PB	LM22-3010PB
LM12-3004PC	LM14-3005PC	LM18-3008PC	LM20-3010PC	LM22-3010PC
LM12-3004LA	LM14-3005LA	LM18-3008LA	LM20-3010LA	LM22-3010LA
LM12-3004LB	LM14-3005LB	LM18-3008LB	LM20-3010LB	LM22-3010LB
LM12-2004A	LM14-2005A	LM18-2008A	LM20-2010A	LM22-2010A
LM12-2004B	LM14-2005B	LM18-2008B	LM20-2010B	LM22-2010B
		LM18-2008C	LM20-2010C	LM22-2010C
200mA	200mA	200mA	200mA	200mA
300mA	300mA	300mA	300mA/1A	300mA
直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
15 × 15 × 1(A3 铁 iron)	15 × 15 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	20 × 20 × 1(A3 铁 iron)	22 × 22 × 1(A3 铁 iron)
0.01	0.02	0.02	0.05	0.05
400Hz/25Hz	300Hz/25Hz	200Hz/25Hz	200Hz/25Hz	200Hz/25Hz
-25℃ ~ +75℃	-25℃ ~ +75℃	-25℃ ~ +75℃	-25℃ ~ +75℃	-25℃ ~ +75℃
≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
金属 Metal	金属 Metal	金属 Metal	ABS 塑料 Plastic	金属 Metal
IP67	IP67	IP67	IP67	IP67
E2E-X5 □□	LJ14A3- □□	LJ18A3-8- □□		LJ22A □ - □ - □□

- 结构分类：圆柱型
Structural category: Cylinder type
- 外形图例
Outward appearance illustration



外形编号 Outward appearance code				LM24	LM30	LM34	LM35		
外形尺寸 Overall dimensions									
埋入式 Flush	检测距离 Detection distance			8mm	10mm				
	直流 DC 6~36 VDC	NPN	NO	LM24-3008NA	LM30-3010NA				
			NC	LM24-3008NB	LM30-3010NB				
			NO+NC	LM24-3008NC	LM30-3010NC				
		PNP	NO	LM24-3008PA	LM30-3010PA				
			NC	LM24-3008PB	LM30-3010PB				
			NO+NC	LM24-3008PC	LM30-3010PC				
		二线制 two wire system		NO	LM24-3008LA	LM30-3010LA			
				NC	LM24-3008LB	LM30-3010LB			
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon	NO	LM24-2008A	LM30-2010A				
			NC	LM24-2008B	LM30-2010B				
			NO+NC	LM24-2008C	LM30-2010C				
继电器输出 Relay output			LM30-2010JC						
检测距离 Detection distance			10mm	15mm	17mm	17mm			
非埋入式 Non-flush	直流 DC 6~36 VDC	NPN	NO	LM24-3010NA	LM30-3015NA	LM34-3017NA	LM35-3017NA		
			NC	LM24-3010NB	LM30-3015NB	LM34-3017NB	LM35-3017NB		
			NO+NC	LM24-3010NC	LM30-3015NC	LM34-3017NC	LM35-3017NC		
		PNP	NO	LM24-3010PA	LM30-3015PA	LM34-3017PA	LM35-3017PA		
			NC	LM24-3010PB	LM30-3015PB	LM34-3017PB	LM35-3017PB		
			NO+NC	LM24-3010PC	LM30-3015PC	LM34-3017PC	LM35-3017PC		
		二线制 two wire system		NO	LM24-3010LA	LM30-3015LA	LM34-3017LA	LM35-3017LA	
				NC	LM24-3010LB	LM30-3015LB	LM34-3017LB	LM35-3017LB	
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon	NO	LM24-2010A	LM30-2015A	LM34-2017A	LM35-2017A		
			NC	LM24-2010B	LM30-2015B	LM34-2017B	LM35-2017B		
			NO+NC	LM24-2010C	LM30-2015C	LM34-2017C	LM35-2017C		
		继电器输出 Relay output			LM30-2015JC	LM34-2017JC	LM35-2017JC		
		输出电流 Out- put current	DC			200mA	200mA	200mA	200mA
			SCR/ 继电器 Relay			300mA	300mA/1A	300mA/1A	300mA/1A
		输出电压降 Output voltage dropDC/AC				直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V			
		消耗电流 Consumption current				直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA			
标准检测物体 Standard detected object				24 × 24 × 1(A3 铁 iron)	30 × 30 × 1(A3 铁 iron)	34 × 34 × 1(A3 铁 iron)	40 × 40 × 1(A3 铁 iron)		
重复精度 Repeated precision				0.05	0.05		.1		
响应频率 DC/AC Response frequency				200Hz/25Hz	200Hz/25Hz	100Hz/15Hz	00Hz/15Hz		
工作环境温度 Working environment temperature				-25℃ ~+75℃	-25℃ ~+75℃	-25℃ ~+75℃	-25℃ ~+75℃		
绝缘电阻 Insulation resistance				≥ 50MΩ	≥ 50MΩ	≥ 250MΩ	≥ 50MΩ		
外壳材料 Shell material				金属 Metal	金属 Metal	金属 Metal	ABS 树脂 Resin		
防护等级 Protection grade				IP67	IP67	IP67	IP67		
可替代国内型号 Alternative model at home and abroad				LJ24A3-10-□□	E2E-X18M□				



LM38	LM40	LM480	LM36	LM42
				
12mm				
LM38-3012NA				
LM38-3012NB				
LM38-3012NC				
LM38-3012PA				
LM38-3012PB				
LM38-3012PC				
LM38-3012LA				
LM38-3012LB				
LM38-2012A				
LM38-2012B				
LM38-2012C				
18mm	20mm	25mm	15mm	20mm
LM38-3018NA	LM40-3020NA	LM480-3025NA	LM36-3015NA	LM42-3020NA
LM38-3018NB	LM40-3020NB	LM480-3025NB	LM36-3015NB	LM42-3020NB
LM38-3018NC	LM40-3020NC	LM480-3025NC	LM36-3015NC	LM42-3020NC
LM38-3018PA	LM40-3020PA	LM480-3025PA	LM36-3015PA	LM42-3020PA
LM38-3018PB	LM40-3020PB	LM480-3025PB	LM36-3015PB	LM42-3020PB
LM38-3018PC	LM40-3020PC	LM480-3025PC	LM36-3015PC	LM42-3020PC
LM38-3018LA	LM40-3020LA		LM36-3015LA	LM42-3020LA
LM38-3018LB	LM40-3020LB		LM36-2015LB	LM42-3020LB
LM38-2018A	LM40-2020A	LM480-2025A	LM36-2015A	LM42-2020A
LM38-2018B	LM40-2020B	LM480-2025B	LM36-2015B	LM42-2020B
LM38-2018C	LM40-2020C	LM480-2025C		
LM38-2018JC	LM40-2020JC			
200mA	200mA	200mA	200mA	200mA
300mA	300mA	300mA/1A	300mA	300mA
直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
40 × 40 × 1(A3 铁 iron)	45 × 45 × 1(A3 铁 iron)	50 × 50 × 1(A3 铁 iron)	45 × 45 × 1(A3 铁 iron)	25 × 25 × 1(A3 铁 iron)
		0.1	0.05	0.2
		100Hz/25Hz	200Hz/10Hz	200Hz/10Hz
-25℃ ~ +75℃		-25℃ ~ +75℃	-25℃ ~ +75℃	-25℃ ~ +75℃
≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
ABS 塑料 Plastic	金属 Metal	金属 Metal	ABS 塑料 Plastic	ABS 塑料 Plastic
IP67		IP67	IP67	IP67
LJ38A4-18- □□	SC- □□	SFE- □□		

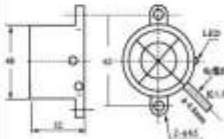
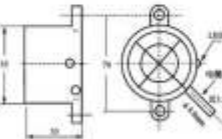
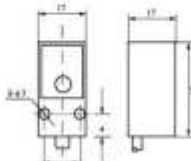
- 结构分类：圆柱型
Structural category: Cylinder type
- 外形图例
Outward appearance illustration



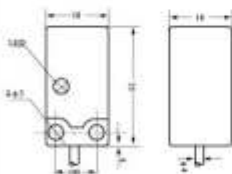
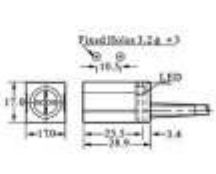
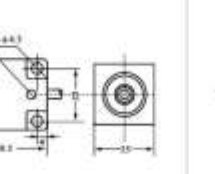
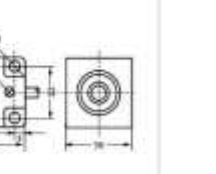
平面安装型 Plane installation type



角柱型 Angular column type

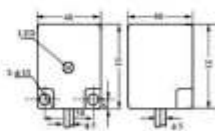
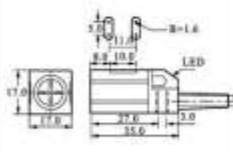
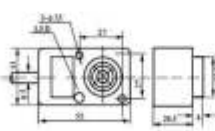
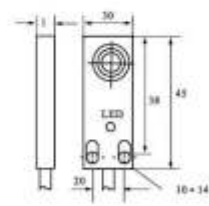
外形编号 Outward appearance code				LM48	LM55	LMF1	LMF2	
外形尺寸 Overall dimensions								
埋入式 Flush	检测距离 Detection distance					5mm	5mm	
	直流 DC 6~36 VDC	NPN	NO			LMF1-3005NA	MF2-3005NA	
			NC			LMF1-3005NB	LMF2-3005NB	
			NO+NC					
		PNP	NO			LMF1-3005PA	LMF2-3005PA	
			NC			LMF1-3005PB	LMF2-3005PB	
			NO+NC					
	交流 AC 90~250 VAC	二线制 two wire system		NO		LMF1-3005LA	LMF2-3005LA	
				NC			LMF2-3005LB	
		SCR 可控硅 Control- lable silicon	NO					
			NC					
继电器输出 Relay output								
非埋入式 Non-flush	检测距离 Detection distance			20mm	25mm			
	直流 DC 6~36 VDC	NPN	NO	LM48-3020NA	LM55-3025NA			
			NC	LM48-3020NB	LM55-3025NB			
			NO+NC	LM48-3020NC	LM55-3025NC			
		PNP	NO	LM48-3020PA	LM55-3025PA			
			NC	LM48-3020PB	LM55-3025PB			
			NO+NC	LM48-3020PC	LM55-3025PC			
	交流 AC 90~250 VAC	二线制 two wire system		NO	LM48-3020LA	LM55-3025LA		
				NC	LM48-3020LB	LM55-3025LB		
		SCR 可控硅 Control- lable silicon	NO	LM48-2020A	LM55-2025A	LMF1-2005A	LMF2-2005A	
			NC	LM48-2020B	LM55-2025B			
		继电器输出 Relay output		LM48-2020C	LM55-2025C			
	输出电流 Out- put current	DC			200mA	200mA	200mA	200mA
		SCR/ 继电器 Relay			300mA	300mA	200mA	200mA
	输出电压降 Output voltage drop		DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
消耗电流 Consumption current		直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA						
标准检测物体 Standard detected object				60×60×1(A3 铁 iron)	55×55×1(A3 铁 iron)	0×20×1(A3 铁 iron)	20×20×1(A3 铁 iron)	
重复精度 Repeated precision				0.2	0.2	0.02	0.02	
响应频率 DC/AC Response frequency				200Hz/10Hz	200Hz/10Hz	400Hz/25Hz	400Hz/25Hz	
工作环境温度 Working environment temperature				-25℃ ~+75℃	-25℃ ~+75℃	-25℃ ~+75℃	-25℃ ~+75℃	
绝缘电阻 Insulation resistance				≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	
外壳材料 Shell material				ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	
防护等级 Protection grade				IP67	IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad				SD- □□	SE- □□	SN04-N	TL-Q5MC1	



LMF3	LMF4	LMF5	LMF6	LMF7
				
5mm	5mm	2mm	8mm	10mm
LMF3-3005NA	LMF4-3005NA	LMF5-3002NA	LMF6-3008NA	LMF7-3010NA
LMF3-3005NB	LMF4-3005NB	LMF5-3002NB	LMF6-3008NB	LMF7-3010NB
	LMF4-3005NC	LMF5-3002NC	LMF6-3008NC	
LMF3-3005PA	LMF4-3005PA	LMF5-3002PA	LMF6-3008PA	LMF7-3010PA
LMF3-3005PB	LMF4-3005PB	LMF5-3002PB	LMF6-3008PB	LMF7-3010PB
	LMF4-3005PC	LMF5-3002PC	LMF6-3008PC	
LMF3-3005LA	LMF4-3005LA	LMF5-3002LA	LMF6-3008LA	LMF7-3010LA
LMF3-3005LB	LMF4-3005LB	LMF5-3002LB	LMF6-3008LB	LMF7-3010LB
			LMF6-2008A	LMF7-2010A
			LMF6-2008B	LMF7-2010B
				LMF7-2010C
		4mm	10mm	15mm
		LMF5-3004NA	LMF6-3010NA	LMF7-3015NA
		LMF5-3004NB	LMF6-3010NB	LMF7-3015NB
		LMF5-3004NC	LMF6-3010NC	LMF7-3015NC
		LMF5-3004PA	LMF6-3010PA	LMF7-3015PA
		LMF5-3004PB	LMF6-3010PB	LMF7-3015PB
		LMF5-3004PC	LMF6-3010PC	LMF7-3015PC
		LMF5-3004LA	LMF6-3010LA	LMF7-3015LA
		LMF5-3004LB	LMF6-3010LB	LMF7-3015LB
LMF3-2005A			LMF6-2010A	LMF7-2015A
LMF3-2005B			LMF6-2010B	LMF7-2015B
				LMF7-2015C
200mA	200mA	200mA	200mA	200mA
200mA		200mA	300mA	300mA
直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
20 × 20 × 1(A3 铁 iron)	20 × 20 × 1(A3 铁 iron)	15 × 15 × 1(A3 铁 iron)	30 × 30 × 1(A3 铁 iron)	35 × 35 × 1(A3 铁 iron)
0.02	0.03	0.03	0.05	0.05
400Hz/25Hz	300Hz	400Hz	200Hz/15Hz	200Hz/15Hz
-25℃ ~ +75℃	-25℃ ~ +70℃	-25℃ ~ +70℃	-25℃ ~ +75℃	-25℃ ~ +75℃
≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic
IP67	IP67		IP67	IP67
PS17-5PN	PS05-N、PS05-P		TL-N5ME □□	TL-N10M □

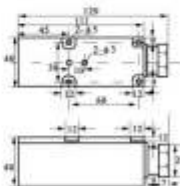
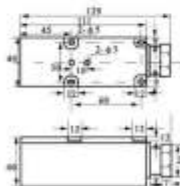
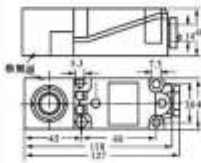
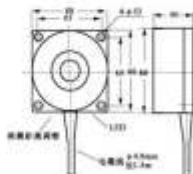
- 结构分类：角柱型
Structural category: Angular column type
- 外形图例
Outward appearance illustration



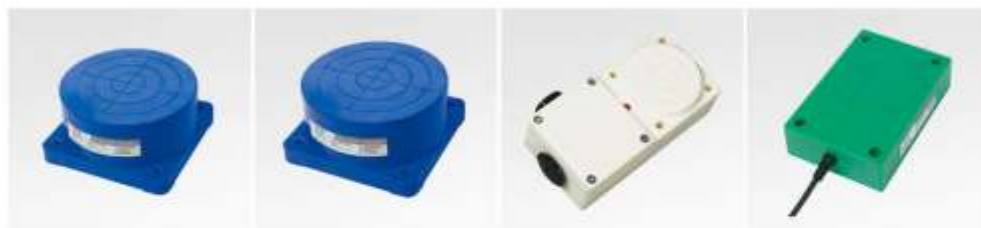
外形编号 Outward appearance code				LMF10	LMF11	LMF12	LMF29	
外形尺寸 Overall dimensions								
埋入式 Flush	检测距离 Detection distance			15mm	5mm		5mm	
	直流 DC 6~36 VDC	NPN	NO	LMF10-3015NA	LMF11-3005NA		LMF29-3005NA	
			NC	LMF10-3015NB	LMF11-3005NB		LMF29-3005NB	
			NO+NC	LMF10-3015NC	LMF11-3005NC		LMF29-3005NC	
		PNP	NO	LMF10-3015PA	LMF11-3005PA		LMF29-3005PA	
			NC	LMF10-3015PB	LMF11-3005PB		LMF29-3005PB	
			NO+NC	LMF10-3015PC	LMF11-3005PC		LMF29-3005PC	
	交流 AC 90~250 VAC	二线制 two wire system		NO	LMF10-3015LA	LMF11-3005LA		LMF29-3005LA
				NC	LMF10-3015LB	LMF11-3005LB		
		SCR 可控硅 Control- table silicon	NO	LMF10-2015A			LMF29-2005A	
			NC	LMF10-2015B			LMF29-2005B	
继电器输出 Relay output			LMF10-2015C					
非埋入式 Non-flush	检测距离 Detection distance			20mm		8mm	8mm	
	直流 DC 6~36 VDC	NPN	NO	LMF10-3020NA		LMF12-3008NA	LMF29-3008NA	
			NC	LMF10-3020NB		LMF12-3008NB	LMF29-3008NB	
			NO+NC	LMF10-3020NC		LMF12-3008NC	LMF29-3008NC	
		PNP	NO	LMF10-3020PA		LMF12-3008PA	LMF29-3008PA	
			NC	LMF10-3020PB		LMF12-3008PB	LMF29-3008PB	
			NO+NC	LMF10-3020PC		LMF12-3008PC	LMF29-3008PC	
	交流 AC 90~250 VAC	二线制 two wire system		NO	LMF10-3020LA	LMF12-3008LA	LMF29-3008LA	
				NC	LMF10-3020LB	LMF12-3008LB	LMF29-3008LB	
		SCR 可控硅 Control- table silicon	NO	LMF10-2020A		LMF12-2008A	LMF29-2008A	
			NC	LMF10-2020B		LMF12-2008B	LMF29-2008B	
	继电器输出 Relay output			LMF10-2020C				
	输出电流 Out-put current				200mA	200mA	200mA	200mA
	SCR/ 继电器 Relay				300mA		300mA	300mA
	输出电压降 Output voltage dropDC/AC				直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V			
消耗电流 Consumption current				直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
标准检测物体 Standard detected object				5 × 45 × 1(A3 铁 iron)	20 × 20 × 1(A3 铁 iron)	25 × 25 × 1(A3 铁 iron)	25 × 25 × 1(A3 铁 iron)	
重复精度 Repeated precision				0.05	0.05	0.04	0.05	
响应频率 DC/AC Response frequency				100Hz/15Hz	500Hz	200Hz/15Hz	300Hz	
工作环境温度 Working environment temperature				-25℃ ~+70℃	-25℃ ~+70℃	-25℃ ~+70℃	-25℃ ~+70℃	
绝缘电阻 Insulation resistance				≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	
外壳材料 Shell material				ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic	
防护等级 Protection grade				IP67	IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad				TL-N20M □	PL-05N PL-05P	LJ1A-24		

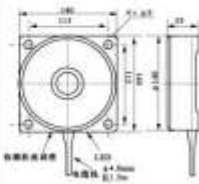
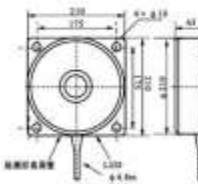
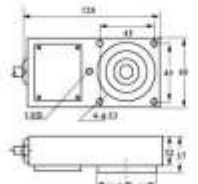
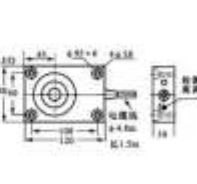
- 结构分类：平面安装型、角柱型
Structural category:
Plane installation type
Angular column type
- 外形图例
Outward appearance illustration



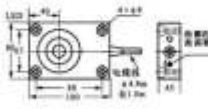
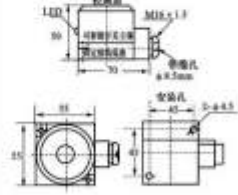
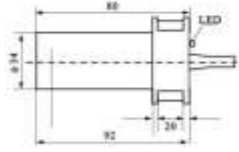
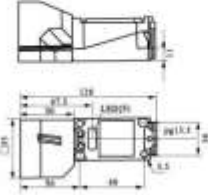
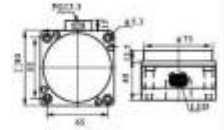
外形编号 Outward appearance code				LMF36	LMF37	LMF38	LMF39	
外形尺寸 Overall dimensions								
埋入式 Flush	检测距离 Detection distance				15mm			
	直流 DC 6~36 VDC	NPN	NO		LMF37-3015NA			
			NC		LMF37-3015NB			
			NO+NC		LMF37-3015NC			
		PNP	NO		LMF37-3015PA			
			NC		LMF37-3015PB			
			NO+NC		LMF37-3015PC			
	交流 AC 90~250 VAC	二线制 two wire system	NO		LMF37-3015LA			
			NC		LMF37-3015LB			
		SCR 可控硅 Control- lable silicon	NO		LMF37-2015A			
NC				LMF37-2015B				
	继电器输出 Relay output			LMF37-2015C				
				LMF37-2015JC				
非埋入式 Non-flush	检测距离 Detection distance			1~20mm	20mm	1~40mm	1~50mm	
	直流 DC 6~36 VDC	NPN	NO	LMF36-3020NA	LMF37-3020NA	LMF38-3040NA	LMF39-3050NA	
			NC	LMF36-3020NB	LMF37-3020NB	LMF38-3040NB	LMF39-3050NB	
			NO+NC	LMF36-3020NC	LMF37-3020NC	LMF38-3040NC	LMF39-3050NC	
		PNP	NO	LMF36-3020PA	LMF37-3020PA	LMF38-3040PA	LMF39-3050PA	
			NC	LMF36-3020PB	LMF37-3020PB	LMF38-3040PB	LMF39-3050PB	
			NO+NC	LMF36-3020PC	LMF37-3020PC	LMF38-3040PC	LMF39-3050PC	
	交流 AC 90~250 VAC	二线制 two wire system	NO	LMF36-3020LA	LMF37-3020LA	LMF38-3040LA		
			NC	LMF36-3020LB	LMF37-3020LB			
			SCR 可控硅 Control- lable silicon	NO	LMF36-2020A	LMF37-2020A	LMF38-2040A	LMF39-2050A
		NC	LMF36-2020B	LMF37-2020B	LMF38-2040B	LMF39-2050B		
			NO+NC	LMF36-2020C	LMF37-2020C	LMF38-2040C	LMF39-2050C	
		继电器输出 Relay output		LMF36-2020JC	LMF37-2020JC	LMF38-2040JC	LMF39-2050JC	
	输出电流 Out-put current	DC		200mA	200mA	200mA	200mA	
		SCR/ 继电器 Relay		300mA/2A	300mA/2A	300mA/2A	300mA/2A	
	输出电压降 Output voltage drop	DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V					
	消耗电流 Consumption current	直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA						
	标准检测物体 Standard detected object			50 × 50 × 1(A3 铁 iron)	50 × 50 × 1(A3 铁 iron)	100 × 100 × 1(A3 铁 iron)	120 × 120 × 1(A3 铁 iron)	
重复精度 Repeated precision			0.2	0.2	0.5	0.5		
响应频率 DC/AC Response frequency			200Hz/15Hz	200Hz/15Hz	50Hz/10Hz	50Hz/10Hz		
工作环境温度 Working environment temperature			-25℃ ~+70℃	-25℃ ~+70℃	-25℃ ~+75℃	-25℃ ~+75℃		
绝缘电阻 Insulation resistance			≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	50MΩ		
外壳材料 Shell material			ABS 树脂 Resin	BS 树脂 Resin	玻璃钢 Resin + Fiber glass reinforced plastics	玻璃钢 Resin + Fiber glass reinforced plastics		
防护等级 Protection grade			IP67	IP67	IP65	IP65		
可替代国内型号 Alternative model at home and abroad				HY-A20 □	TCD-2040 □	TCA-2050 □		

- 结构分类：平面安装型、角柱型
Structural category:
Plane installation type
Angular column type
- 外形图例
Outward appearance illustration



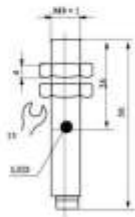
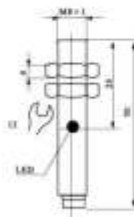
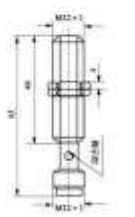
外形编号 Outward appearance code			LMF40	LMF41	LMF42	LMF43	
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance						
	直流 DC 6~36 VDC	NPN	NO				
			NC				
			NO+NC				
		PNP	NO				
			NC				
			NO+NC				
	交流 AC 90~250 VAC	二线制 two wire system	NO				
			NC				
		SCR 可控硅 Control-lable silicon	NO				
		NC					
继电器输出 Relay output		NO+NC					
非埋入式 Non-flush	检测距离 Detection distance		80mm	0~120mm	0~25mm	40mm	
	直流 DC 6~36 VDC	NPN	NO	LMF40-3080NA	LMF41-30120NA	LMF42-3025NA	LMF43-3040NA
			NC	LMF40-3080NB	LMF41-30120NB	LMF42-3025NB	LMF43-3040NB
			NO+NC	LMF40-3080NC	LMF41-30120NC	LMF42-3025NC	LMF43-3040NC
		PNP	NO	LMF40-3080PA	LMF41-30120PA	LMF42-3025PA	LMF43-3040PA
			NC	LMF40-3080PB	LMF41-30120PB	LMF42-3025PB	LMF43-3040PB
			NO+NC	LMF40-3080PC	LMF41-30120PC	LMF42-3025PC	LMF43-3040PC
	交流 AC 90~250 VAC	二线制 two wire system	NO				
			NC				
		SCR 可控硅 Control-lable silicon	NO	LMF40-2080A	LMF41-20120A	LMF42-2025A	LMF43-2040A
			NC	LMF40-2080B	LMF41-20120B	LMF42-2025B	LMF43-2040B
			NO+NC	LMF40-2080C	LMF41-20120C	LMF42-2025C	LMF43-2040C
		继电器输出 Relay output	LMF40-2080JC	LMF41-20120JC	LMF42-2025JC	LMF43-2040JC	
	输出电流 DC		200mA	200mA	200mA	200mA	
	Output current SCR/ 继电器 Relay		300mA/3A	300mA/5A	300mA/2A	300mA/2A	
	输出电压降 Output voltage dropDC/AC		直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
	消耗电流 Consumption current		直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
	标准检测物体 Standard detected object		160 × 160 × 1(A3 铁 iron) 250 × 250 × 1(A3 铁 iron) 80 × 80 × 1(A3 铁 iron) 100 × 100 × 1(A3 铁 iron)				
重复精度 Repeated precision		0.5 0.5 0.05 0.05					
响应频率 DC/AC Response frequency		10Hz/5Hz 10Hz/5Hz 50Hz/10Hz 30Hz/10Hz					
工作环境温度 Working environment temperature		-25℃ ~+75℃ -25℃ ~+75℃ -25℃ ~+70℃ -25℃ ~+70℃					
绝缘电阻 Insulation resistance		50MΩ 50MΩ 50MΩ 50MΩ					
外壳材料 Shell material		玻璃钢 Fiber glass reinforced plastics 玻璃钢 Fiber glass reinforced plastics ABS 树脂 Resin ABS 树脂 Resin					
防护等级 Protection grade		IP65 IP65 IP65 IP65					
可替代国内型号 Alternative model at home and abroad		TCB-2080 □ TCC-2120 □					



LMF45	LMF55	LMF340	LMF370	LMF380
				
0-50mm	25mm	20mm	40mm	40mm
LMF45-3050NA	LMF55-3025NA	M340-3020NA	LMF370-3040NA	LMF380-3040NA
LMF45-3050NB	LMF55-3025NB	M340-3020NB	LMF370-3040NB	LMF380-3040NB
LMF45-3050NC	LMF55-3025NC	M340-3020NC	LMF370-3040NC	LMF380-3040NC
LMF45-3050PA	LMF55-3025PA	M340-3020PA	LMF370-3040PA	LMF380-3040PA
LMF45-3050PB	LMF55-3025PB	M340-3020PB	LMF370-3040PB	LMF380-3040PB
LMF45-3050PC	LMF55-3025PC	M340-3020PC	LMF370-3040PC	LMF380-3040PC
LMF45-3050LA		M340-3020LA	LMF370-3040LA	LMF380-3040LA
LMF45-3050LB			LMF370-3040LB	LMF380-3040LB
LMF45-2050A	LMF55-2025A	M340-2020A	LMF370-2040A	LMF380-2040A
LMF45-2050B	LMF55-2025B	M340-2020B	LMF370-2040B	LMF380-2040B
	LMF55-2025C			
200mA	300mA	200mA	200mA	200mA
300mA	300mA/2A	300mA	300mA	300mA
直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
80 × 80 × 1(A3 铁 iron)	70 × 70 × 1(A3 铁 iron)	35 × 35 × 1(A3 铁 iron)	55 × 55 × 1(A3 铁 iron)	50 × 50 × 1(A3 铁 iron)
0.5	0.2	.05	0.5	0.05
200Hz/5Hz	200Hz/10Hz	00Hz/10Hz	200Hz/10Hz	500Hz/10Hz
-25℃ ~ +70℃	-25℃ ~ +70℃	25℃ ~ +70℃	-25℃ ~ +70℃	-25℃ ~ +70℃
50MΩ	50MΩ	0MΩ	50MΩ	50MΩ
ABS 塑料 Plastic	ABS 树脂 Resin	ABS 塑料 Plastic	ABS 塑料 Plastic	BC 塑料 Plastiic
IP65	IP65	P65	IP65	P65
				J40P-FP-A2-P1

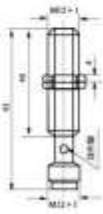
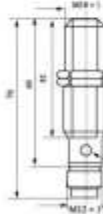
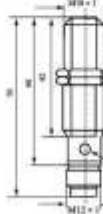
- 结构分类：角柱型、接插件型
Structural category:
Angular column type
Connector type
- 外形图例
Outward appearance illustration



外形编号 Outward appearance code				LM8- □□ T	LM8- □□ T3	LM12- □ T	
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance			1mm	1mm	2mm	
	直流 DC 6~36 VDC	NPN	NO	LM8-3001NAT	LM8-3001NAT3	LM12-3002NAT	
			NC	LM8-3001NBT	LM8-3001NBT3	LM12-3002NBT	
			NO+NC			LM12-3002NCT	
		PNP	NO	LM8-3001PAT	LM8-3001PAT3	LM12-3002PAT	
			NC	LM8-3001PBT	LM8-3001PBT3	LM12-3002PBT	
			NO+NC			LM12-3002PCT	
		二线制 two wire system		NO	LM8-3001LAT	LM8-3001LAT3	LM12-3002LAT
				NC			LM12-3002LBT
		交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon		NO		LM12-2002AT
			NC		LM12-2002BT		
			NO+NC				
检测距离 Detection distance							
非埋入式 Non-flush	直流 DC 6~36 VDC	继电器输出 Relay output		2mm	2mm	4mm	
		NPN	NO	LM8-3002NAT	LM8-3002NAT3	LM12-3004NAT	
			NC	LM8-3002NBT	LM8-3002NBT3	LM12-3004NBT	
			NO+NC			LM12-3004NCT	
		PNP	NO	LM8-3002PAT	LM8-3002PAT3	LM12-3004PAT	
			NC	LM8-3002PBT	LM8-3002PBT3	LM12-3004PBT	
			NO+NC			LM12-3004PCT	
		二线制 two wire system		NO	LM8-3002LAT	LM8-3002LAT3	LM12-3004LAT
				NC			LM12-3004LBT
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon		NO	LM8-2002AT	LM8-2002AT	LM12-2004AT
				NC			LM12-2004BT
		NO+NC					
继电器输出 Relay output							
输出电流 Out-put current	DC			150mA	150mA	200mA	
	SCR/ 继电器 Relay				150mA	200mA	
输出电压降 Output voltage dropDC/AC				直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V			
消耗电流 Consumption current				直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA			
标准检测物体 Standard detected object				8 × 8 × 1(A3 铁 iron)	8 × 8 × 1(A3 铁 iron)	12 × 12 × 1(A3 铁 iron)	
重复精度 Repeated precision				0.01	0.01	0.01	
响应频率 DC/AC Response frequency				500Hz/10Hz	500Hz/10Hz	400Hz/10Hz	
工作环境温度 Working environment temperature				-25℃ ~+70℃	-25℃ ~+70℃	-25℃ ~+70℃	
绝缘电阻 Insulation resistance				50MΩ	50MΩ	50MΩ	
外壳材料 Shell material				金属 Metal	金属 Metal	金属 Metal	
防护等级 Protection grade				IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad				E2E-X1R5-M1	E2E-X2ME1-M1	E2E-X2E1-M1	

- 结构分类：接插件型
Structural category: Connector type
- 外形图例
Outward appearance illustration

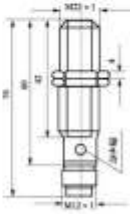
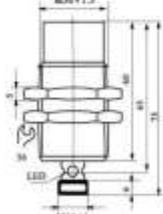
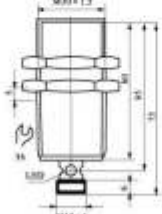
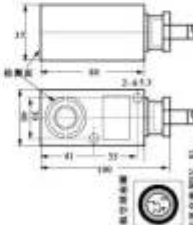


外形编号 Outward appearance code				LM12- □ T3	LM18- □ T	LM18- □ T3	LM22- □ T
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance			2mm	5mm	5mm	7mm
	直流 DC 6~36 VDC	NPN	NO	LM12-3002NAT3	LM18-3005NAT	LM18-3005NAT3	LM22-3007NAT
			NC	LM12-3002NBT3	LM18-3005NBT	LM18-3005NBT3	LM22-3007NBT
			NO+NC	LM12-3002NCT3	LM18-3005NCT	LM18-3005NCT3	LM22-3007NCT
		PNP	NO	LM12-3002PAT3	LM18-3005PAT	LM18-3005PAT3	LM22-3007PAT
			NC	LM12-3002PBT3	LM18-3005PBT	LM18-3005PBT3	LM22-3007PBT
			NO+NC	LM12-3002PCT3	LM18-3005PCT	LM18-3005PCT3	LM22-3007PCT
		二线制 two wire system	NO	LM12-3002LAT3	LM18-3005LAT	LM18-3005LAT3	LM22-3007LAT
			NC	LM12-3002LBT3	LM18-3005LBT	LM18-3005LBT3	LM22-3007LBT
			NO+NC	LM12-3002LCT3	LM18-3005LCT	LM18-3005LCT3	LM22-3007LCT
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon 继电器输出 Relay output	NO	LM12-2002AT3	LM18-2005AT	LM18-2005AT3	LM22-2007AT
			NC	LM12-2002BT3	LM18-2005BT	LM18-2005BT3	LM22-2007BT
			NO+NC				
非埋入式 Non-flush	检测距离 Detection distance			4mm	8mm	8mm	10mm
	直流 DC 6~36 VDC	NPN	NO	LM12-3004NAT3	LM18-3008NAT	LM18-3008NAT3	LM22-3010NAT
			NC	LM12-3004NBT3	LM18-3008NBT	LM18-3008NBT3	LM22-3010NBT
			NO+NC	LM12-3004NCT3	LM18-3008NCT	LM18-3008NCT3	LM22-3010NCT
		PNP	NO	LM12-3004PAT3	LM18-3008PAT	LM18-3008PAT3	LM22-3010PAT
			NC	LM12-3004PBT3	LM18-3008PBT	LM18-3008PBT3	LM22-3010PBT
			NO+NC	LM12-3004PCT3	LM18-3008PCT	LM18-3008PCT3	LM22-3010PCT
		二线制 two wire system	NO	LM12-3004LAT3	LM18-3008LAT	LM18-3008LAT3	LM22-3010LAT
			NC	LM12-3004LBT3	LM18-3008LBT	LM18-3008LBT3	LM22-3010LBT
			NO+NC	LM12-3004LCT3	LM18-3008LCT	LM18-3008LCT3	LM22-3010LCT
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon 继电器输出 Relay output	NO	LM12-2004AT3	LM18-2008AT	LM18-2008AT3	LM22-2010AT
			NC	LM12-2004BT3	LM18-2008BT	LM18-2008BT3	LM22-2010BT
			NO+NC				
	输出电流 Out-put current			200mA	200mA	200mA	200mA
	DC			200mA	200mA	200mA	200mA
	SCR/ 继电器 Relay			200mA	300mA	300mA	300mA
	输出电压降 Output voltage dropDC/AC			直流 (NPN、PNP) 型 3V 以下、二线型：3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V			
	消耗电流 Consumption current			直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA			
标准检测物体 Standard detected object			12 × 12 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	25 × 25 × 1(A3 铁 iron)	
重复精度 Repeated precision			0.01	0.02	0.02	0.036	
响应频率 DC/AC Response frequency			400Hz/10Hz	200Hz/10Hz	200Hz/10Hz	200Hz/10Hz	
工作环境温度 Working environment temperature			-25℃ ~+70℃	-25℃ ~+65℃	-25℃ ~+65℃	-25℃ ~+65℃	
绝缘电阻 Insulation resistance			50MΩ	50MΩ	50MΩ	50MΩ	
外壳材料 Shell material			金属 Metal	金属 Metal	金属 Metal	金属 Metal	
防护等级 Protection grade			IP67	IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad			E2E-X5ME1-M1	E2E-X5E1-M1	E2E-X10ME1-M1		



- 结构分类: 接插件型
Structural category: Connector type
- 外形图例
Outward appearance illustration



外形编号 Outward appearance code			LM22- □ T3	LM30- □ T	LM30- □ T3	LMF16- □ T	
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance		7mm	10mm	10mm		
	直流 DC 6~36 VDC	NPN	NO	LM22-3007NAT3	LM30-3010NAT	LM30-3010NAT3	
			NC	LM22-3007NBT3	LM30-3010NBT	LM30-3010NBT3	
			NO+NC	LM22-3007NCT3	LM30-3010NCT	LM30-3010NCT3	
		PNP	NO	LM22-3007PAT3	LM30-3010PAT	LM30-3010PAT3	
			NC	LM22-3007PBT3	LM30-3010PBT	LM30-3010PBT3	
			NO+NC	LM22-3007PCT3	LM30-3010PCT	LM30-3010PCT3	
	交流 AC 90~250 VAC	二线制 two wire system	NO	LM22-3007LAT3	LM30-3010LAT	LM30-3010LAT3	
			NC	LM22-3007LBT3	LM30-3010LBT	LM30-3010LBT3	
		SCR 可控硅 Control- lable silicon	NO	LM22-2007AT3	LM30-2010AT	LM30-2010AT3	
NC			LM22-2007BT3	LM30-2010BT	LM30-2010BT3		
继电器输出 Relay output							
非埋入式 Non-flush	检测距离 Detection distance		10mm	15mm	15mm	15mm	
	直流 DC 6~36 VDC	NPN	NO	LM22-3010NAT3	LM30-3015NAT	LM30-3015NAT3	LMF16-3015NAT
			NC	LM22-3010NBT3	LM30-3015NBT	LM30-3015NBT3	LMF16-3015NBT
			NO+NC	LM22-3010NCT3	LM30-3015NCT	LM30-3015NCT3	LMF16-3015NCT
		PNP	NO	LM22-3010PAT3	LM30-3015PAT	LM30-3015PAT3	LMF16-3015PAT
			NC	LM22-3010PBT3	LM30-3015PBT	LM30-3015PBT3	LMF16-3015PBT
			NO+NC	LM22-3010PCT3	LM30-3015PCT	LM30-3015PCT3	LMF16-3015PCT
	交流 AC 90~250 VAC	二线制 two wire system	NO	LM22-3010LAT3	LM30-3015LAT	LM30-3015LAT3	LMF16-3015LAT
			NC	LM22-3010LBT3	LM30-3015LBT	LM30-3015LBT3	LMF16-3015LBT
		SCR 可控硅 Control- lable silicon	NO	LM22-2010AT3	LT30-2015AT	LM30-2015AT3	LMF16-2015AT
NC			LM22-2010BT3	LT30-2015BT	LM30-2015BT3	LMF16-2015BT	
继电器输出 Relay output							
输出电流 Out- put current		DC	200mA	200mA	200mA	200mA	
		SCR/ 继电器 Relay	300mA	300mA	300mA	300mA	
输出电压降 Output voltage drop		DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V				
消耗电流 Consumption current			直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA				
标准检测物体 Standard detected object			45 × 45 × 1 (A3 铁 iron)				
重复精度 Repeated precision			0.05	0.05	0.05	0.05	
响应频率 DC/AC Response frequency			200Hz/10Hz	200Hz/10Hz	200Hz/10Hz	200Hz/10Hz	
工作环境温度 Working environment temperature			-25℃ ~+65℃	-25℃ ~+65℃	-25℃ ~+65℃	-25℃ ~+65℃	
绝缘电阻 Insulation resistance			50MΩ	50MΩ	50MΩ	10MΩ	
外壳材料 Shell material			金属 Metal	金属 Metal	金属 Metal	ABS 树脂 Resin	
防护等级 Protection grade			IP67	IP67	IP67	IP67	
可替代国内型号 Alternative model at home and abroad				E2E-X18ME1-M1	E2E-X18ME1-M1	LJ2-15/211	

- 类 型
Structural category
- 外形图例
Outward appearance illustration



外形编号 Outward appearance code	PK01-1-2	PK01-1-3	PK01-2-2	PK01-2-3	PK01-2-2-4	PK01-2-3-4	PK02-1-2
外形尺寸 Overall dimensions							
接插外形 Contact view							
应用 Application	DC 二线 AC 二线 NO/NC NPN/PNP NO/NC DC 二线 AC 二线 NO/NC NPN/PNP NO/NC DC 二线 AC 二线 NO/NC NPN/PNP NO/NC DC 二线 AC 二线 NO/NC NPN/PNP NO/NC DC 二线 AC 二线 NO/NC						
接插件 Connector 外套颜色 连接螺母材料 接触负载 过流值 额定电压 电缆 Wire 长度 Length 电缆外皮材料 cable serving color 绝缘体颜色 insulator color 输出显示 output display 通电指示 power indicator 一般数据 common data 绝缘电阻 insulation resistance 环境温度范围：接插件 environment temperature scope 环境温度范围：电缆 environment temperature scope 防护等级 (DIN 40 050) protection level 电容量 (VDE 0110b) Capacitance	黑 black CuZn,nickel plated 4.0 250 2m PVC black bn,bu,bk 3×0.5 bn,bu 2×0.5 bn,bu 2×0.5 bn,bu,bk,wh 4×0.34 1 — — — ≥ 10 ⁹ Ω -25…+80 -25…+80 IP67 250VAC/300VDC,Gr.C						

- 类 型
Structural category
- 外形图例
Outward appearance illustration

弯形孔座接插电缆
接插件 M12×1



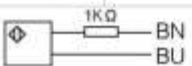
外形编号 Outward appearance code	PK02- 1-3	PK02- 1-4	PK02- 2-2	PK02- 2-3-N	PK01- 2-3-P	PK02- 2-4-N	PK02- 2-4-P	PK03- 3	PK03- 4
外形尺寸 Overall dimensions									
接插外形 Contact view									
应用 Application	NPN/PNP NO/NC	NPN/PNP NO+NC	DC 二线 AC 二线 NO/NC	NPN NO/NC	PNP NO/NC	NPN NO+NC	PNP NO/NC	NPN/PNP NO+NC	NPN/PNP NO+NC
接插件 Connector 外套颜色 连接螺母材料	黑 black CuZn,nickel plated								
接触负载 过流值 [A] 额定电压 [V]									
电缆 Wire 长度 Length	4.0								
电缆外皮材料	250								
cable serving color	2m								
绝缘体颜色	PVC								
insulator color									
接插件夹紧能力 φ1 connector clamp capacity									
输出显示 [LED] output display	bn,bu,bk	bn,bu,bk,wh	YES	YES	YES	YES	YES	YES	YES
通电指示 [LED] power indicator	3×0.5	4×0.34							
一般数据 common data	-								
绝缘电阻	-								
insulation resistance	≥ 10 ⁹ Ω								
环境温度范围：接插件 [° C] environment temperature scope	-25...+80								
环境温度范围：电缆 [° C] environment temperature scope	-25...+80								
防护等级 (DIN 40 050) protection level	IP67								
电容量 (VDE 0110b) Capacitance	250VAC/300VDC,Gr.C								

■ 安全防爆接近开关

NAMUR 传感器，亦称安全防爆型接近开关。是根据德国科技标准 NAMUR，NIN1923 技术文件数据生产，是相对于化学工业的标准，计量设计的。因 NAMUR 传感器为低电压供电，微电流输出，体积小等等特点，所以在具有防爆要求的特殊场合应用。

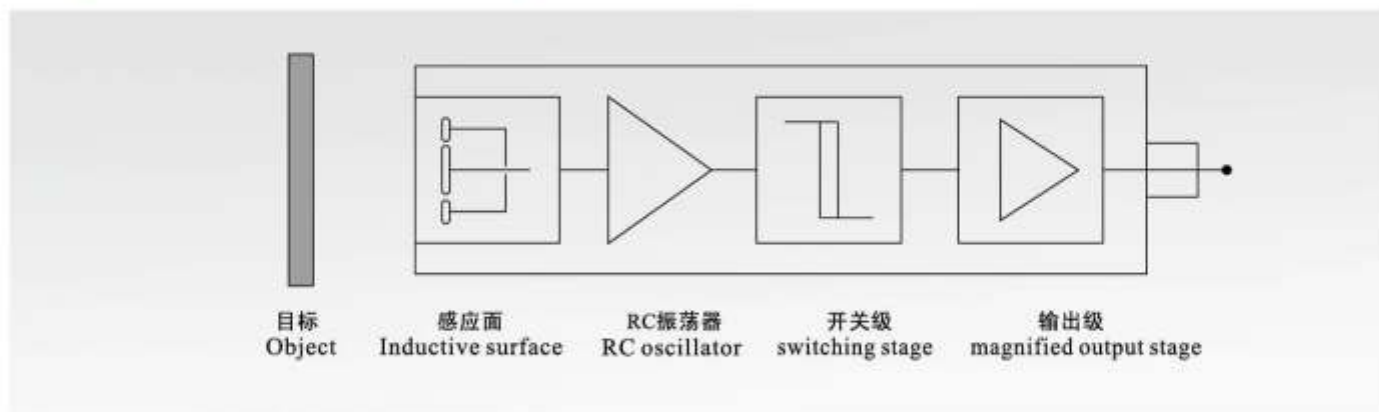
NAMUR sensor, also called safety explosion proof proximity switch, is made according to NAMUR and NIN 1923, measured and designed as per chemical industry standard.

结构分类 Structural category: 传感器 Namur

外型编号 Outward appearance code		AM8-3001LB AM8-3002LB		AM18-3005LB AM18-3008LB	
外形图例 utward appearance illustration					
		AM12-3002LB AM12-3004LB		AM30-3010LB AM30-3015LB	
					
额定检测距离 Sn:(mm)					
标准检测体 Q235 钢 (mm) standard detecting object Q235 steel(mm)		12 × 12 × 1t	12 × 12 × 1t	18 × 18 × 1t	30 × 30 × 1t
具备型号 Model	二线常闭 埋入 Embedded	AM8-3001LB	AM12-3002LB	AM18-3005LB	AM30-3010LB
	二线常闭 非埋 Non-embedded	AM8-3002LB	AM12-3004LB	AM18-3008LB	AM30-3015LB
技术 参数	额定电压 rated Voltage	8.2V	8.2V	8.2V	8.2V
	震荡电流 / 停荡电流 oscillating current/ stop oscillating current	≥ 2.2mA/ ≤ 1mA	≥ 2.2mA/ ≤ 1mA	≥ 2.2mA/ ≤ 1mA	≥ 2.2mA/ ≤ 1mA
	负载电阻 load resistance	1KΩ	1KΩ	1KΩ	1KΩ
	开关频率: 埋入 / 非埋 switch frequency, flush/non-flush	1.5KHz/1KHz	1.5KHz/1KHz	1KHz/700KHz	300KHz/200KHz
	外壳材料 shell material	黄铜镀镍 brass	黄铜镀镍 brass	黄铜镀镍 brass	黄铜镀镍 brass
	防护等级 protection grade	IP67	IP67	IP67	IP67
	工作环境温度 working environment temperature	-20℃ ~ 70℃	-20℃ ~ 70℃	-20℃ ~ 70℃	-20℃ ~ 70℃
外接线图 external wiring diagram					

■ 电容式接近开关的工作原理

Working principle of capacitance proximity switch

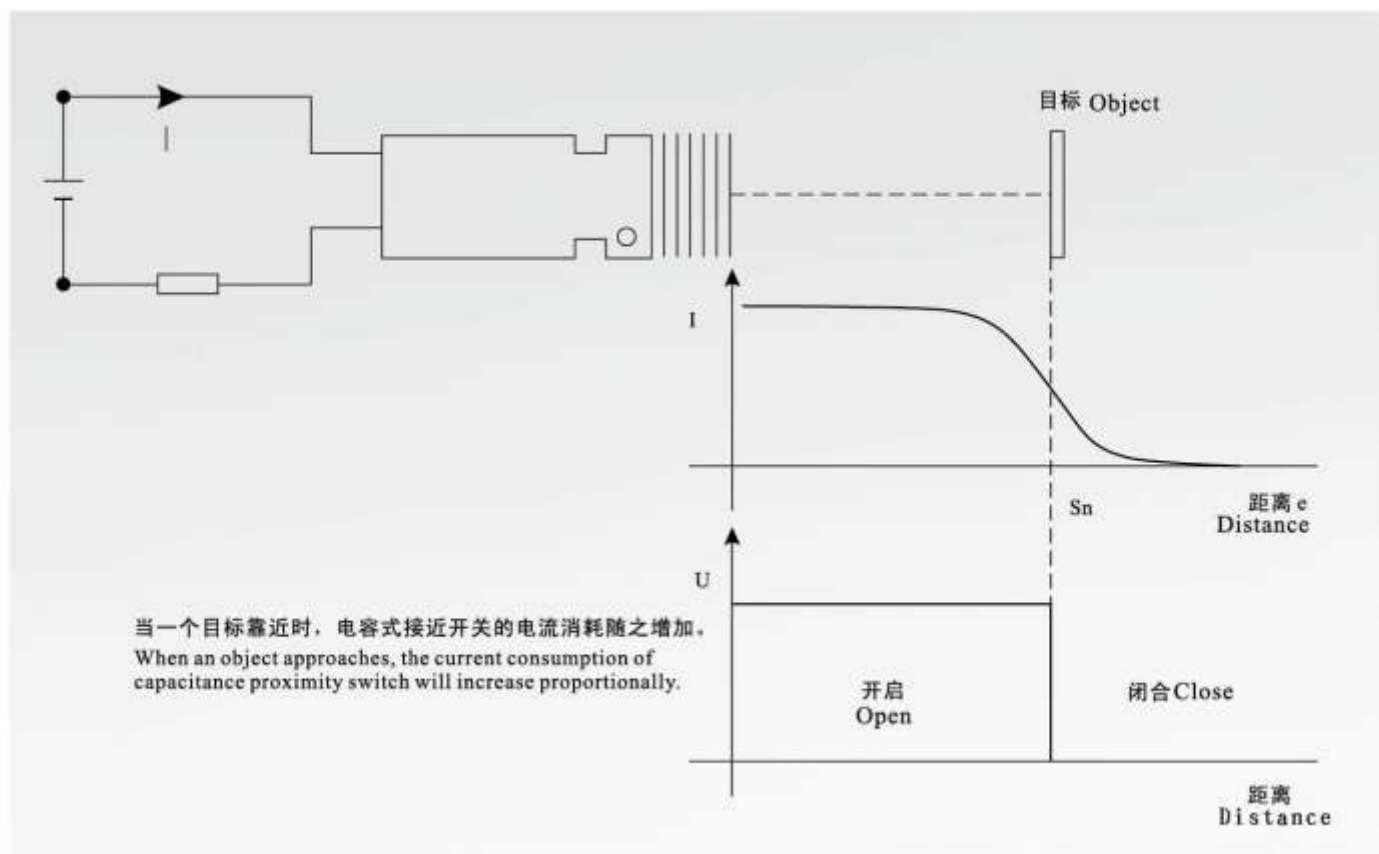


电容式传感器的感应面由两个同轴金属电极构成，很象“打开的”电容电极，该两个电极构成一个电容，串接在RC振荡回路内。

电源接通时，RC振荡器不振荡，当一个目标朝着电容器的电极靠近时，电容器的容量增加，使振荡器开始振荡。通过后续电路的处理，将停振和振荡两种信号转换成开关信号，从而起到了检测有无物体存在的目的。该传感器能检测金属物体，也能检测非金属物体，对金属物体可以获得最大的动作距离，对非金属物体动作距离决定于材料的介电常数 ϵ ，材料的介电常数越大，可获得的动作距离越大。

The induction surface of capacitance sensor is composed of two coaxial metal electrodes, which form a capacitor and connected on RC oscillation circuit, just like an open capacitor electrode.

When connecting to power supply, RC oscillator does not work. When an object is close to capacitor electrode, the capacitor capacity will increase, and the oscillator will vibrate. Through the treatment of behind stage circuit, both signals of stop oscillation and oscillation will be converted to switch signs for checking the existence of object. This sensor can detect both metal and non-metal objects. For the metal object, the max. action distance can be obtained, but to nonmetal object, the action distance is determined by material dielectric constant, the more dielectric constant, the more action distance will be obtained.



■ 一些重要材料的介电常数如下表:

he dielectric constants for some important materials are as listed as below:

材料 Materials	介电常数 Dielectric constant	材料 Materials	介电常数 Dielectric constant	材料 Materials	介电常数 Dielectric constant	材料 Materials	介电常数 Dielectric constant
合成树脂粘结剂 synthetic resin adhesive	3.6	苯乙烯 Styrene	3	酒精 Alcohol	25.8	聚乙烯化合物 Polyvinyl	2.9
云母 Mica	6	陶瓷 Porcelain	4.4	玻璃 Glass	5	石英玻璃 Quartz glass	3.7
硬橡胶 Ebonite	4	石蜡 Earth wax	2.2	硬纸 Cardboard	4.5	硅 Silicon	2.8
大理石 Marble	8	石英沙 Quartz sand	4.5	电缆胶皮化合物 Cable rubber compound	2.5	木材 Chamber	2.7
纸 Paper	2.3	软橡胶 Soft rubber	2.5	汽油 Gasoline	2.2		
有机玻璃 Organic glass	3.2	水 Water	80				

■ 应用图例 application illustration



图1、液位测量—塑料或玻璃器皿
liquid level measurement--plastic or glass container

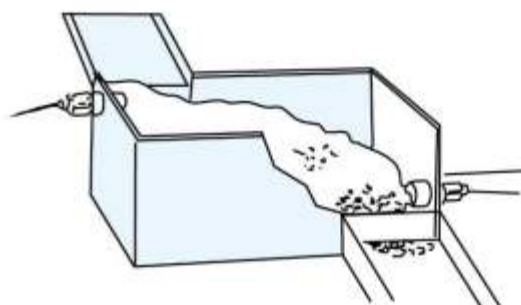


图2、料位测量
material level measurement

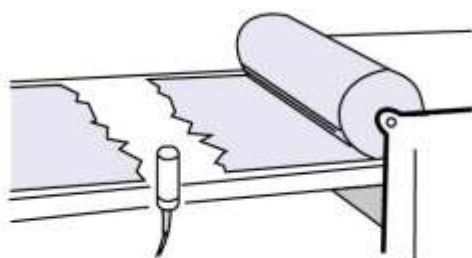


图3、断板检测
chart 3 checking for broken board

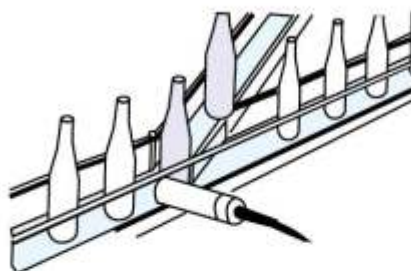


图4、瓶子计数
Fig.4 Count the bottles

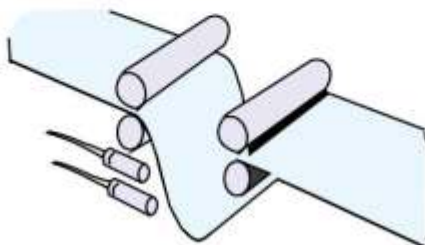


图5、传送带松紧度检测
Fig.5 detect the tightness of conveyor belt

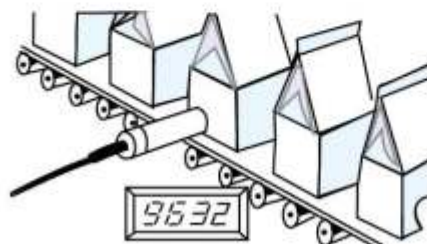
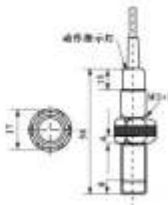
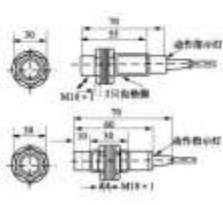
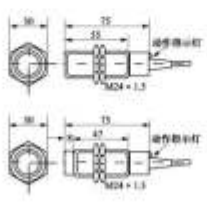
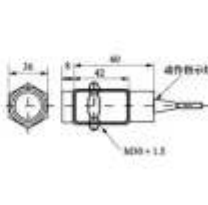


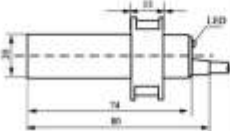
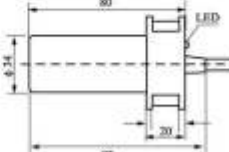
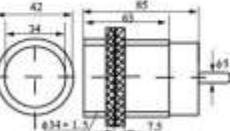
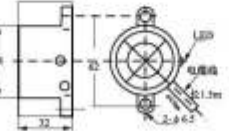
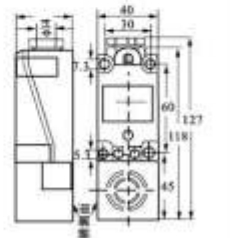
图6、计数及料位检测
Fig.6 Counter and detect the material level

○ 外形图例
Outward appearance illustration



外形编号 Outward appearance code				CM12	CM18	CM24	CM30
外形尺寸 Overall dimensions							
埋入式 Flush	检测距离 Detection distance				0-5mm	0-8mm	0-10mm
	直流 DC 10~30 VDC	NPN	NO		CM18-3005NA	CM24-3008NA	CM30-3010NA
			NC		CM18-3005NB	CM24-3008NB	CM30-3010NB
			NO+NC		CM18-3005NC	CM24-3008NC	CM30-3010NC
		PNP	NO		CM18-3005PA	CM24-3008PA	CM30-3010PA
			NC		CM18-3005PB	CM24-3008PB	CM30-3010PB
			NO+NC		CM18-3005PC	CM24-3008PC	CM30-3010PC
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon	NO		CM18-2005A	CM24-2008A	CM30-2010A
			NC		CM18-2005B	CM24-2008B	CM30-2010B
非埋入式 Non-flush	检测距离 Detection distance			0-4mm	0-8mm	0-12mm	0-15mm
	直流 DC 10~30 VDC	NPN	NO	CM12-3004NA	CM18-3008NA	CM24-3012NA	CM30-3015NA
			NC	CM12-3004NB	CM18-3008NB	CM24-3012NB	CM30-3015NB
			NO+NC		CM18-3008NC	CM24-3012NC	CM30-3015NC
		PNP	NO	CM12-3004PA	CM18-3008PA	CM24-3012PA	CM30-3015PA
			NC	CM12-3004PB	CM18-3008PB	CM24-3012PB	CM30-3015PB
			NO+NC		CM18-3008PC	CM24-3012PC	CM30-3015PC
	交流 AC 90~250 VAC	SCR 可控硅 Control- lable silicon	NO		CM18-2008A	CM24-2012A	CM30-2015A
			NC		CM18-2008B	CM24-2012B	CM30-2015B
可检测体 Detectable object				导体及介电体 conductor and dielectric body			
消耗电流 Consumption current				直流 (NPN, PNP) 型 DC12V 时 8mA, 24V 时 15mA, 交流型: 10mA 以下、DC < 15mA、AC < 10mA			
输出电流 Output current				直流: 200mA, 交流型: 200mA、			
输出电压降 Output voltage drop DC/AC				直流 (NPN, PNP) 3V 以下, 交流型: 7V 以下、DC < 3V、AC < 7V			
响应频率 DC/AC Response frequency				直流 50Hz, 交流型: 10Hz			
外壳材料 Shell material				金属 Metal	ABS 树脂 / 金属 Resin, Metal	金属 Metal	ABS 树脂 / 金属 Resin, Metal
工作环境温度 Working environment temperature				-25℃ ~ 70℃			
绝缘电阻 Insulation resistance				50MΩ			
防护等级 Protection grade				IEC 标准 IP54 IEC standard IP54			
可替代国内型号 Alternative model at home and abroad					LJC18A3- □□	LJC24A3- □□	2K-X15M □



CM20	CM34	CM35	CM48	CMF37
				
0-10mm	0-20mm	0-25mm	0-20mm	0-25mm
CM20-3010NA	CM34-3020NA	CM35-3025NA	CM48-3020NA	CMF37-3025NA
CM20-3010NB	CM34-3020NB	CM35-3025NB	CM48-3020NB	CMF37-3025NB
CM20-3010NC	CM34-3020NC	CM35-3025NC	CM48-3020NC	CMF37-3025NC
CM20-3010PA	CM34-3020PA	CM35-3025PA	CM48-3020PA	CMF37-3025PA
CM20-3010PB	CM34-3020PB	CM35-3025PB	CM48-3020PB	CMF37-3025PB
CM20-3010PC	CM34-3020PC	CM35-3025PC	CM48-3020PC	CMF37-3025PC
CM20-2010A	CM34-2020A	CM35-2025A	CM48-2020A	CMF37-2025A
CM20-2010B	CM34-2020B	CM35-2025B	CM48-2020B	CMF37-2025B

导体及介电体 conductor and dielectric body

直流 (NPN, PNP) 型 DC12V 时 8mA, 24V 时 15mA, 交流型: 10mA 以下 DC < 15mA、AC < 10mA

直流: 200mA, 交流型: 200mA

直流 (NPN, PNP) 3V 以下, 交流型: 7V 以下、DC < 3V、AC < 7V

频率 NPN-PNP) 50Hz, 交流型: 10Hz

ABS 树脂 Resin

ABS 塑料 Plastic

-25°C ~70°C

50MΩ

IEC 标准 IP54 IEC standard IP54

E2K-C25 □□

一、简介 Brief Introduction

SM 系列霍尔传感器是由电压调整器，霍尔电压发生器，差分放大器，施密特触发器和集电极开路的输出级组成的磁敏传感器，其输入为磁感应强度、输出是一个数字电压讯号。

SM series Hall sensor is a kind of magnet-sensitive sensor consisting of voltage regulator, Hall voltage generator, differential amplifier, Schmidt trigger and the output pole of collector open circuit. Its input is the magnetic flux density. The output is a digital voltage signal.

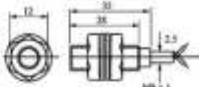
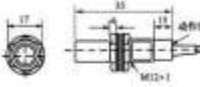
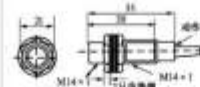
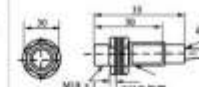
二、特点 Features

- 电源电压范围宽
- 频率高
- 寿命长，体积小，安装方便
- 能直接和晶体管及 TTL.MOS 等逻辑电路接口
- Wide mains voltage range
- High frequency
- Long service life, compact volume, and convenient installation
- Directly connect to transistor and logic circuit port like, TTL.MOS

三、型号及参数 Model and parameters

- 外形图例
Outward appearance illustration



外形编号 Outward appearance code	SM8	SM12	SM14	SM18	
外形尺寸 Overall dimensions					
检测距离 Detection distance	10mm	10mm	10mm	10mm	
电源电压 Power voltage	5~24VDC	5~24VDC	5~24VDC	5~24VDC	
可检测物体 Detectable object	永磁体 Permanent magnet	永磁体 Permanent magnet	永磁体 Permanent magnet	永磁体 Permanent magnet	
输出低电平电压 Output low level voltage	200mV	200mV	200mV	200mV	
输出高电平电流 Output high level voltage	0.1uA	0.1uA	0.1uA	0.1uA	
电源电流 Power current	8mA	8mA	8mA	8mA	
开关频率 ON-OFF frequency	320KHz				
工作点磁强度 Working point magnetic density	22mT				
外壳材料 Shell material	金属 M etal				
环境温度 Ambient temperature	~25℃ ~70℃				
防护等级 Protection grade	EC 标准 IP67 IEC standard IP67				
具备型号 Model available	NPN NO	SM8-31010NA	SM12-31010NA	SM14-31010NA	SM18-31010NA
	PNP NO	SM8-31010PA	SM12-31010PA	SM14-31010PA	SM18-31010PA
	NPN NC		SM12-31010NB	SM14-31010NB	SM18-31010NB
	PNP NC		SM12-31010PB	SM14-31010PB	SM18-31010PB

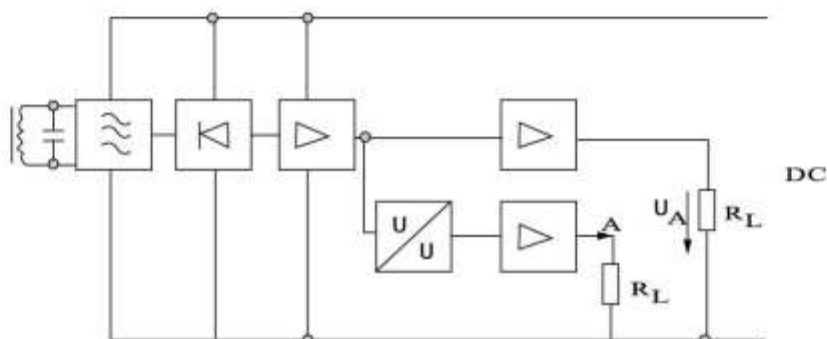
■ 工作原理 Work principle

带模拟量输出的电感式接近开关与普通电感式接近开关的工作原理相同，当一个金属物体靠近传感器的感应面时，振荡器系统的能量减小，能量减小的程度是物体和传感器之间距离的尺寸标志，在一个附加电器中能量损耗被转换成测量信号，经线性化处理后被放大。(图5) 在输出端提供一个标准模拟信号(0~5V或4~20mA)。

Inductive proximity switch with analog quantity output has the similar work principle with general inductive proximity switch. The energy of oscillator system decreases when a metal object approaches the inductive side. The energy decrease degree indicates the distance between the metal object and the sensor.

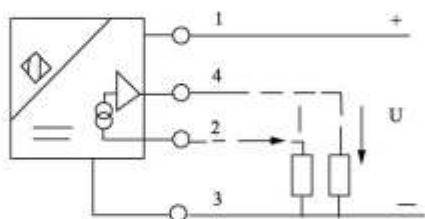
The energy consumption is transformed into measuring sign in an additional device and magnified through linear treatment. (Fig. 5) Provide a standard analog signal at output terminal (0-5V or 4-20mA).

带模拟量输出的电感式接近开关的工作原理
work principle of inductive proximity switch with analog quantity

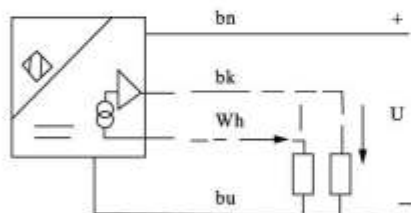


■ 接线示意图 Installation and connection

用连接端子引出
lead out with connecting terminal



用导线引出
lead out with conductor

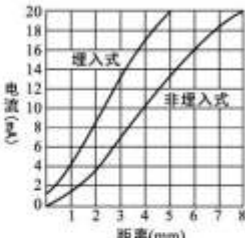
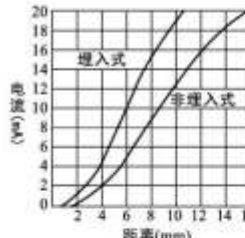
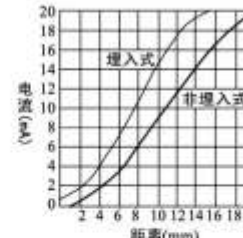
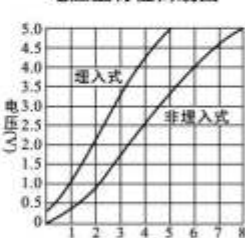
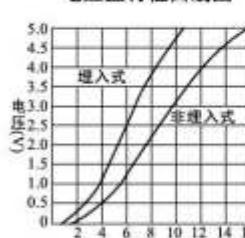
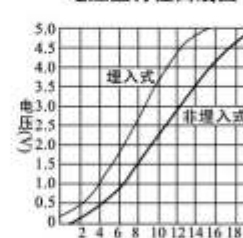


注：芯线颜色BN=棕、BK=黑、BU=蓝、WH=白

Note: the color of core line BN= brown, BK=black, BU= blue, and YE=yellow

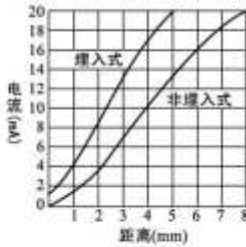
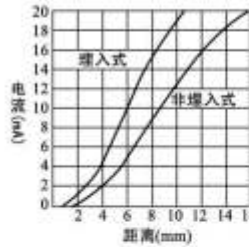
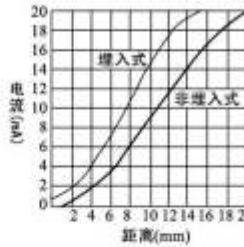
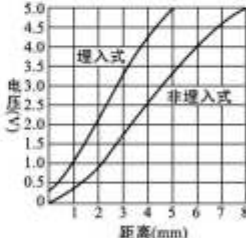
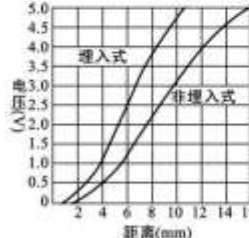
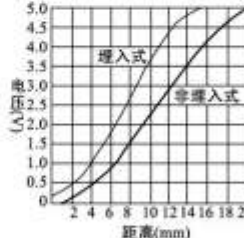
分类 Category

电感式位移量线性传感器 induction displacement volume linear sensor

外形编号 Outward appearance code		XM18		XM24		XM30	
外形尺寸 Overall dimensions							
可检测物体 Detectable object		金 属 Metal		金 属 Metal		金 属 Metal	
检测距离 Detection distance		埋入式 : 5mm Flush type: 5mm	非埋入式 : 8mm Non-flush: 8mm	埋入式 : 8mm Flush type: 8mm	非埋入式 : 10mm Non-flush: 10mm	埋入式 : 10mm Flush type: 10mm	非埋入式 : 15mm Non-flush: 15mm
具备型号 Model available	电流型 Current type	XM18-3005PMI	XM18-3008PMI	XM24-3008PMI	XM24-3010PMI	XM30-3010PMI	XM30-3015PMI
	电压型 Voltage type	XM18-3005PMU	XM18-3008PMU	XM24-3008PMU	XM24-3010PMU	XM30-3010PMU	XM30-3015PMU
电压范围 Voltage range		15~30VDC					
功 耗 Consumption	检测时 at the time of detection	≤ 200mA...<4mA					
	无检测时 at the time of non-detection	≤ 20mA					
负载电阻 Loading resistance	电流型 Current type	0~300 Ω					
	电压型 Voltage type	≥ 2.2K Ω					
输 出 Output	电流型 Current type	4~20mA					
	电压型 Voltage type	0~5V/0~10V					
输出特性图 Output characteristic diagram		电流型特性曲线图 		电流型特性曲线图 		电流型特性曲线图 	
		电压型特性曲线图 		电压型特性曲线图 		电压型特性曲线图 	
		允许电压波动 Allowable voltage undulation					
		输出信号 Output signal					
线性误差 Linear error		PNP 模拟 PNP Simulation					
环境温度 Ambient temperature		± 5%					
外壳材料 Shell material		-10℃ ~+70℃					
防护等级 Protection grade		塑料、金属 Plastic, Metal					
		IP54					

◎ 分类 Category

电感式位移量线性传感器 induction displacement volume linear sensor

外形编号 Outward appearance code		XMF10		XMF37		XMF38	
外形尺寸 Overall dimensions							
可检测物体 Detectable object		金 属 Metal		金 属 Metal		金 属 Metal	
检测距离 Detection distance		埋入式: 15mm Flush type: 15mm	非埋入式: 20mm Non-flush: 20mm	埋入式: 15mm Flush type: 15mm	非埋入式: 20mm Non-flush: 20mm	埋入式: 40mm Flush type: 40mm	非埋入式: 50mm Non-flush: 50mm
具备型号 Model available	电流型 Current type	XMF10-3015PMI	XMF10-3020PMI	XMF37-3015PMI	XMF37-3020PMI	XMF38-3040PMI	XMF38-3050PMI
	电压型 Voltage type	XMF10-3015PMU	XMF10-3020PMU	XMF37-3015PMU	XMF37-3020PMU	XMF38-3040PMU	XMF38-3050PMU
电压范围 Voltage range		15~30VDC					
功 耗 Consumption	检测时 at the time of detection	≤ 200mA...<4mA					
	无检测时 at the time of non-detection	≤ 20mA					
负载电阻 Loading resistance	电流型 Current type	0~300 Ω					
	电压型 Voltage type	≥ 2.2K Ω					
输 出 Output	电流型 Current type	4~20mA					
	电压型 Voltage type	0~5V/0~10V					
输出特性图 Output characteristic diagram		电流型特性曲线图 		电流型特性曲线图 		电流型特性曲线图 	
		电压型特性曲线图 		电压型特性曲线图 		电压型特性曲线图 	
允许电压波动 Allowable voltage undulation		≤ 5%					
输出信号 Output signal		PNP 模拟 PNP Simulation					
线性误差 Linear error		± 5%					
环境温度 Ambient temperature		-10℃ ~+70℃					
外壳材料 Shell material		塑料、金属 Plastic, Metal					
防护等级 Protection grade		IP54					

■ 舌簧传感器 reed sensor

舌簧传感器又称磁性开关，适用于气动、液动、气缸和活塞泵的位置测定亦可作限位开关用。当磁性目标接近时，舌簧闭合经放大输出开关信号。与电感式传感器比较有以下优点，能安装在金属中可并排紧密安装，可穿过金属进行检测。其检测距离随检测体磁场的强弱的变化而变化。舌簧传感器不适用于强烈震动的场合。

Also called magnetic switch, reed sensor is applicable for position determination of pneumatic and/or hydraulic cylinder and piston pump. It also can be used as limit switch. When the magnetic object approaches, the reed closes and sends out switch signal through magnification. Compared with inductive sensor, it has the following strongpoints: can be installed in metal closely and side by side and detect through metal object. Its detection distance subjects to the intensity of magnetic field of detected object. Reed sensor is not applicable in the occasion of severe vibration.



D-SM2C 34×9×7×10



CK3-J, CK-4 23×10×7×5



TAIY0-YR101 27×10×9



HWK23(GH1) 34×16×6



D-K59 33×15×12



D-A80 33×12×14



HL-30 30×12×12



TCS1-F 26×12×10



SR-401 40×32×20



TCS2-E 26×12×10



SR-402 34×35×10

■ 光电开关工作原理 Principle of photoelectric switch

光电开关的原理是根据投光器发出的光束，被物体阻断或部分反射，受光器最终据此作出判断反应。

The principle of photoswitch; the projector will judge and react on the basis of light beam from the projector which is interdicted by object or emitted partly.

■ 类型说明 Description

对射式（透过型）Diact type (through type) 对射式光电开关是将投光器与受光器置于相对的两个装置，光束也是在相对的两个装置之间，穿达投光器与受光器之间的物体会阻断光束并启动受光器。（图 R1）

Through-beam type photoelectric switch is designed that via the light beam between opposite-mounted transmitter and receiver, the object passing through these two devices will interrupt the light beam and start the receiver. (Fig. R1)

■ 扩散反射型（漫反射型）Diffuse type

扩散反射型光电开关将投光器与受光器置于一体，光电开关反射的光被检测物体反射回受光器。（图 R2）

Diffuse reflection type photoelectric switch integrates the transmitter and the receiver. Light reflected by the photoelectric switch is reflected back to the receiver by the detected object. (Fig. R2)

■ 镜面反射型（反馈反射型）Retroreflective type

镜面反射型的反射式光电开关也将投光器与受光器置于一体，它不同于其它模式是它采用反射板将光线反射到光电开关，光电开关与反射板之间的物体虽然也会反射光线，但其效率远低于反射板，因而切断反射光束。（图 R3）

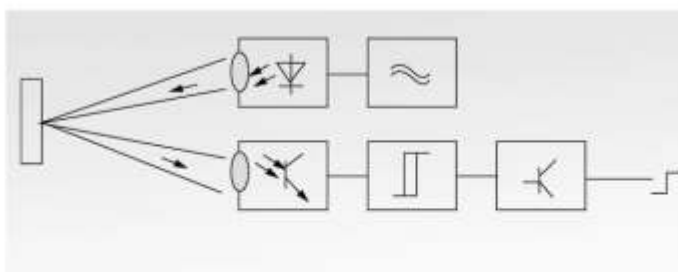
Retroreflective type photoelectric switch also integrates the transmitter and the receiver. Its difference from other models is that reflector is used to reflect light to the photoelectric switch. Though the object between the photoelectric switch and reflector can reflect the light, it is much less efficient than the reflector so as to cut down reflected light (Fig. R3)

■ 会聚型反射式（聚光型）

Convergence reflection type (condensation type)

会聚型反射式的光电开关的工作原理类似于直接反射式光电开关，然而其投光器与受光器聚焦于物距离，只有当物体出现在聚焦时，光电开关才有动作。（图 R4）

The working principle of convergence reflection type photoswitch is similar to that of direct reflection type one, while its projector and light receiver focus on object distance, only when the object presents to the focus can the photoswitch actuate. (Fig. R4)



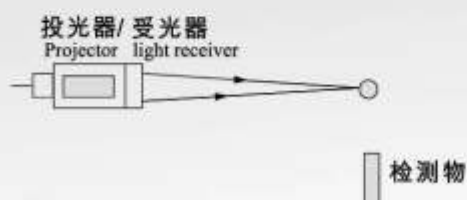
图R1



图R2



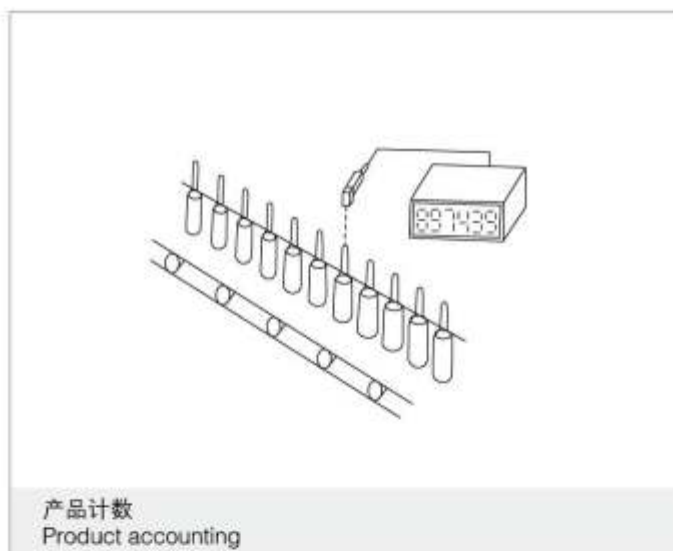
图R3



图R4

■ 光电开关应用图例

Application illustration of photoelectric switch



■ 光电开关型号构成及含义 Model composition and definition of infrared ray photoelectric switch.

G	18	-	3	A	10	N	A	□
1	2	-	3	4	5	6	7	8

编 号 N.o	构成 Composition	代码及含义 Code and definition
1	基本形式 Basic form	G: 红外线光电开关 infrared ray photoelectric switch
2	外形编号 Outward appearance code	18, 50, 76……
3	工作电压 Working voltage	2:90~250VAC 3:10~30VDC 4:12~240VDC/24~240VAC 5: 特殊电压 Special voltage
4	检测方式 Detection way	A: 漫反射型 (扩散反射型) B: 反馈反射型 (镜面反射型) C: 透过型 (对射型) D: 标记检测型 G: 光纤型 E: 槽型 A:diffused reflection type(scattered reflection type) B:feedbase reflection type mirror(mirror reflection type) C:penetration type(correlation type) D:marking detection type G:optical fiber type
5	检测距离 Detection distance	05:5cm 10:10cm 30:30cm 101:10m
6	输出形式 Output form	N: NPN 直流负逻辑输出 P: PNP 直流正逻辑输出 J: 继电器触点输出 L: 交流二线输出 S: 具备 NPN 和 PNP 二种输出 N: NPN transistor output P: PNP transistor output J: Relay contact output L: AC two-wire output S: with two outputs: NPN and PNP
7	输出状态 Output state	A: 常开 (入光 NO) B: 常闭 (遮光 NC) C: 一开一闭 Z: 常开常闭可逆 A: Normally open(light entering NO) B: Normally close(light sheltering NC) C: normally open+normally close
8	附属功能 Subsidiary	T1: 前延时 front delay T2: 后延时 rear delay Y: 防油型 T: 带航空插件 with aviation connector I: 特殊要求 special requirement

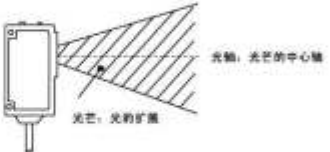
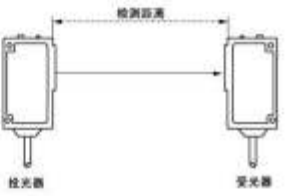
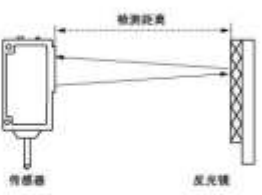
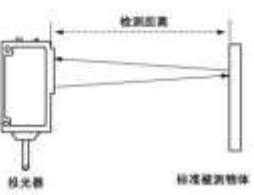
■ 例: G18-3A10NA For example: G18-3A 10NA

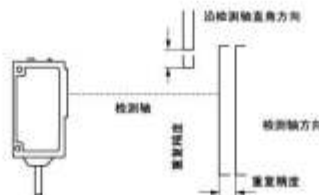
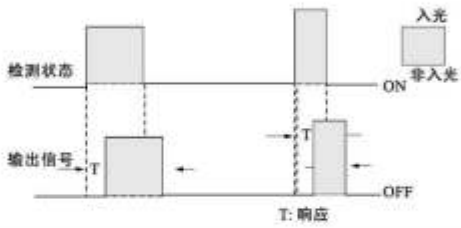
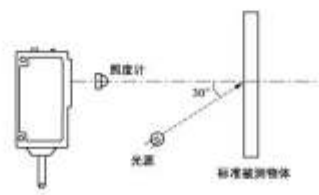
表示: M18 圆柱形 DC10~30V 工作电压, 漫反射型, 检测距离为 10cm, NPN (负逻辑) 常开式的红外线光电开关。

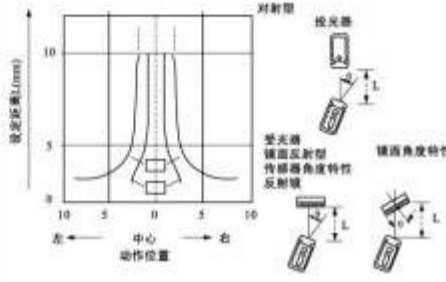
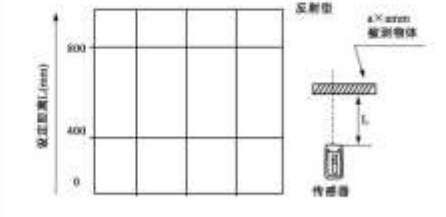
That indicates the infrared ray photoelectric switch of M18 cylinder, DC 10~30V working voltage,diffused reflection type,detection distance 10 cm, and NPN normally open type.

■ 光电开关术语解释

Explanation of technical terms of photoelectric switch

术语 Technical Terms	解释 Explanation
光芒光轴 Optic axis of radance	 光轴，光芒的中心轴 光芒，光芒的扩展
检测轴 Detection axis	 检测轴 光轴 光芒轴 检测轴和光芒轴的中心轴在通过型中即为光轴
检测距离 Detection distance	对射型 可稳定设定的投光器和受光器之间的距离 Correlation type Stably set distance between light projector and photoreceptor  检测距离 投光器 受光器
	反馈反射型 标准设定的传感器和反射之间的距离 (0 的场合将 "0" 省略) Feedback reflection type Standard setting distance between sensor and reflection mirror (omit "0" on the occasion with "0")  检测距离 传感器 反光镜
	漫反射型 可稳定被检测物体 (通常是白色无光纸) 能被稳定检测的最大距离 (0 的场合将 "0" 的场合半 "0" 省略) Diffused reflection type The max stable detectable distance of detectable object, generally white matt paper (omit "0" on the occasion with "0")  检测距离 投光器 标准检测物体

术语 Technical Terms	解释 Explanation
标准被测物体 Standard detected object	指在反射型传感器中为决定基本规格面作为标准的被测物体。一般是白色无光，对专用传感器使用相应的被测物体 (例如薄片。) That indicates the standard detected object, which is to determine the basic specifications in the reflection type sensor. Generally, it is white and lusterless. Use relevant detected object (for example, the slice) to the sensor for special purpose.
最小被测物体 Min detected object	指一定条件下传感器能测出的最小物体。 对射型，镜面反射型是指不透明体 (完全遮光)，对反射型是指铁丝或铜丝相应的值。 That indicates the smallest object, which can be detected by sensor under a certain condition. To correlation type and mirror reflection type, that indicates opaque body (wholly light sheltering). To reflection type, that indicates the corresponding value of iron wire or copper wire.
重复精度 Repeated precision	指一定条件下，重复动作时响应位置的误差。 That indicates the error of response position when repeating action under a certain condition.  沿检测轴垂直方向 检测轴 检测轴方向 重复精度
响应时间 Response time	检测状态变化后输出 ON 或 OFF 信号的迟延时间。 That indicates the delayed time of outputting ON or OFF signal after the detected state changes. 检测状态变化后到输出 ON 或 OFF 信号的迟延时。  检测状态 输出信号 入光 非入光 ON OFF T: 响应
使用环境照度 (耐杂散光) Intensity of illumination of operating environment (resistance to mixed astigmatism)	指不引起误动作的极限照度用光接收器光面照度表示。 That indicates max. intensity of illumination, which doesn't result in error action, expressed by intensity of illumination of photoreceptor photic surface.  照度计 30° 光源 标准检测物体

术语 Technical Terms	解释 Explanation
角度特性 Angle characteristic	在对射型以及反馈反射型中,在各设定距离内,从右方在左方向中心线移动,使角度逐渐变小,以传感器动作响应的角度为轨迹所表示的图(灵敏度最大状态下)。 To correlation type and feedback reflection type, move from right to the centerling of left direction within each setting distance to gradually reduce the angle. That is shown by locus diagram of sensor action response angle (under max sensitivity state) 
被检测物体大小和检测距离特性 The characteristic of detected object size and detection distance	表示在反射型中,因被物体大小对检测距离影响的规律。此图对根据被测物体大小决定能稳定检测的距离有用。带有灵敏度旋钮的传感器是将灵敏度调到与刚好能检测标准被测物体的最大检测距离响应的位置。 To reflection type, because the size of detected object affects detection distance, this diagram is useful to determine the stable detection distance according to the size of detected object. The sensor with sensitivity button is to turn the sensitivity to the relevant position of max. Detection distance where exactly detecting the standard detected object. 

■ 使用注意事项 Cautions

距离设定 Distance equipment

对射型 反馈反射型

设定距离应小于说明书上规定的检测距离。由于留有余量,大于所规定的检测距离虽也能工作。但性能不能保证。另外,在有垃圾和尘埃的恶劣环境中,距离设定时,请保证一定的余量。

To correlation type and feedback reflection type

The set distance should be less than the detection distance stipulated in the operation instruction. Because of keeping a room, although it can work when the set distance is bigger than the stipulated detection distance, the performance cannot be guaranteed. In addition, please make sure to keep certain room in the bad environment with rubbish and dust when setting a distance.

漫射型

规格书上登出的检测距离是相对于标准被测物体而言的。实际的检测距离,因被测物体大小,颜色及表面的凹凸状况不同,会有所变化。距离设定时,请保证规定的余量。

随被测物体大小变化,检测距离的变化规律被测物体越大,反光量越大,检测距离越长。但是,当物体的受光面的大小已大于受光的检测,物体大小再增大,检测距离也不会增大。

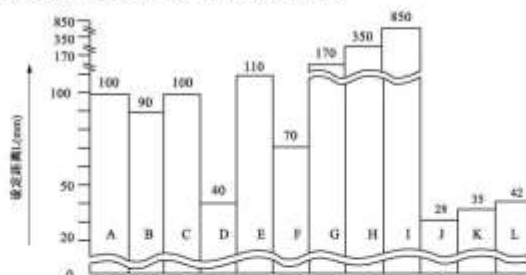
To diffused reflection type

The detection distance shown in the specification manual is in accordance with standard detected object. Actual detection distance will change in pace with the change of the size, color, surface evenness of detected object. Please ensure the stipulated room when set distance.

According to the change of detected object size and variation regulation of detection distance, bigger detected object, bigger reflection volume, longer detection distance. But when the size of optic receiving surface is bigger than the size of the detected object, the detection distance won't increase even if the object size increases again.

被测物体不同检测距离的差异(适用于漫反射型)

The difference between different detection distances of the detected object(Apply to scattered reflection type)



A、白色无光纸(基准) B、自然色的纸箱 C、胶合 D、黑色无光纸(三级光泽度)
 E、有光泽的胶合板(自然的米黄板,褐色丙烯酸板,红色乙烯合成革) F、灰色乙烯合成革 G、有绿色光泽的橡胶板
 H、铝板 I、反射器或反射板 J、φ10 的锈铁棒 K、黑布 L、深蓝色布

A. White matt paper(reference)
 B. Natural color carton
 C. Veneer
 D. Black matt paper(Grade 3 glossiness)
 E. Glossy veneer (Natural cream-colored board, brown propylene board, red ethylene synthetic board)
 F. Grey ethylene synthetic board
 G. Green glossy rubber board
 H. Alboard
 I. Reflector or reflecting board
 J. Rusty iron barφ10
 K. Black cloth
 L. Dark blue cloth

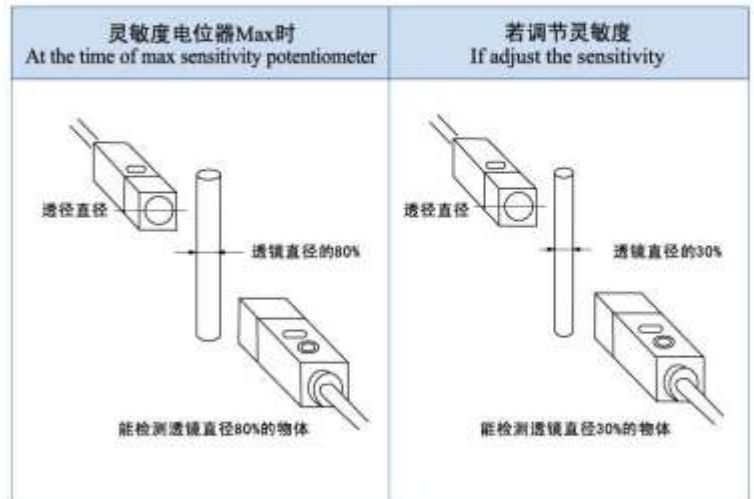
防止相互干扰的方法及注意事项

Method of anti mutual-interference and cautions

把光电传感器接近设置时，另一个传感器的光入射时造成的不稳定动作，叫做相互干扰。

The unstable action resulted from the entrance light from another sensor while the photoelectric sensor is approaching the equipment is called mutual interference.

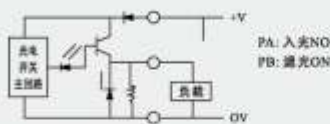
- 投光器、受光器相互交叉安装。
- 反射式并列使用时，相互间隔须维持设定距离在检测距离的 1.4 倍以上。
- 对射式并列使用时，相互间隔须维持设定距离在检测距离的 0.4 倍以上。
- Mutual cross installation of optic projector and photoreceptor
- When using reflection type in parallel, the mutual spacing should be kept at over 1.4 times detection distance.
- When using correlation type in parallel, the mutual spacing should be kept at over 0.4 times detection distance.
- 电源电压请在使用电源电压范围内使用。
- 下列安装场所会造成误动作原因，请注意：
 - ① 灰尘较多场所
 - ② 腐蚀性气体较多的场所
 - ③ 水、油、药剂直接溅散的场所
 - ④ 室外或太阳光等有强光直射的场所



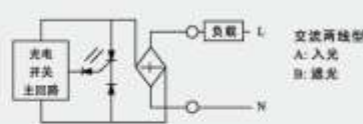
- The mains voltage should be within the range of operating mains voltage.
- The following installation occasions will result in error action, take note of.
 - ① Dusty occasion
 - ② The occasion with corrosive gas
 - ③ The occasion directly spattered with water, oil and agent, etc
 - ④ Outdoor or the occasion directly shine by hard light like, sunlight

光电开关输出回路图 Output return diagram of photoelectric switch

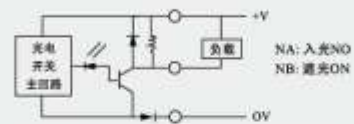
PA、PB型输出回路图



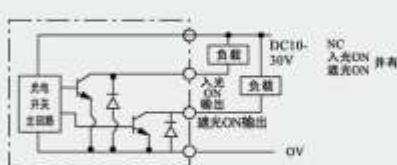
SCR(可控硅)型输出回路图(二线)



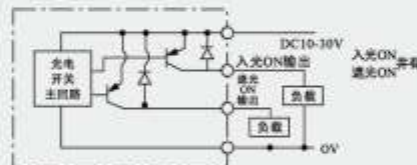
NA、NB型输出回路图



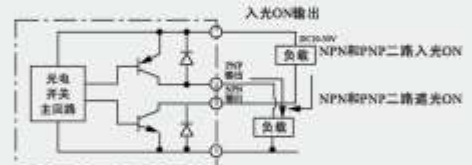
NC型输出回路图



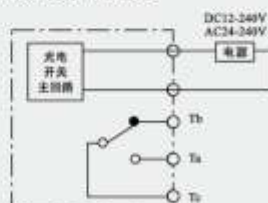
PC型输出回路图



NPN、PNP同时具备型输出回路图



JC型输出回路图



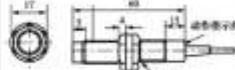
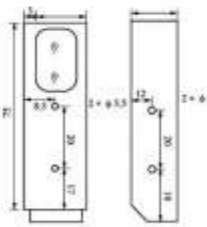
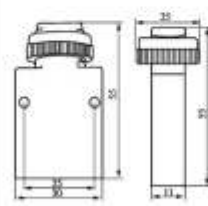
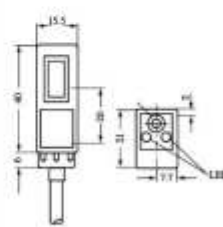
红外发射器二线型



外形图例

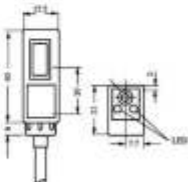
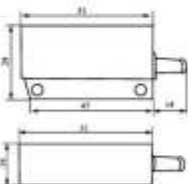
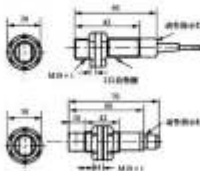
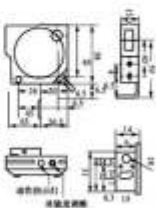
Outward appearance illustration



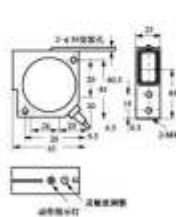
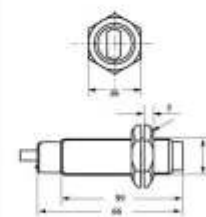
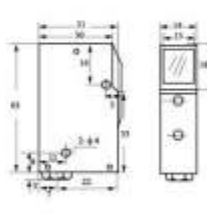
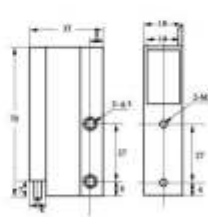
外形编号 Outward appearance code				G12	G13	G14	G15
外形尺寸 Overall dimensions							
漫反射型 Diffuse type	检测距离 Detection distance			7cm	10cm	10cm	10cm
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G12-3A07NA	G13-3A10NA	G14-3A10NA	G15-3A10NA
			NC	G12-3A07NB	G13-3A10NB	G14-3A10NB	G15-3A10NB
			NO+NC				
		正逻辑 PNP	NO	G12-3A07PA	G13-3A10PA	G14-3A10PA	G15-3A10PA
			NC	G12-3A07PB	G13-3A10PB	G14-3A10PB	G15-3A10PB
			NO+NC				
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
		NC					
继电器输出 Relay output							
反馈反射型 Retroreflective	检测距离 Detection distance			1m	1m	1m	1m
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G12-3B1NA	G13-3B1NA	G14-3B1NA	G15-3B1NA
			NC	G12-3B1NB	G13-3B1NB	G14-3B1NB	G15-3B1NB
			NO+NC				
		正逻辑 PNP	NO	G12-3B1PA	G13-3B1PA	G14-3B1PA	G15-3B1PA
			NC	G12-3B1PB	G13-3B1PB	G14-3B1PB	G15-3B1PB
			NO+NC				
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
		NC					
继电器输出 Relay output							
对射型 Trough beam	检测距离 Detection distance			3m	3m	3m	3m
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G12-3C3NA	G13-3C3NA	G14-3C3NA	G15-3C3NA
			NC	G12-3C3NB	G13-3C3NB	G14-3C3NB	G15-3C3NB
			NO+NC				
		正逻辑 PNP	NO	G12-3C3PA	G13-3C3PA	G14-3C3PA	G15-3C3PA
			NC	G12-3C3PB	G13-3C3PB	G14-3C3PB	G15-3C3PB
			NO+NC				
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
		NC					
继电器输出 Relay output							
输出电流 DC/SCR/ 继电器 Control output				DC: 200mA			
消耗电流 DC/AC Consumption current				DC<15mA			
响应时间 DC/AC Response time				DC<2ms			
指向角 Directional angle				3° ~10°			
检测物体 Detected object				透明或不透明体 transparent or opaque body			
工作环境温度 Working environment temperature				-25℃ ~+55℃			
工作环境照度 Intensity of illumination of working environment				太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX			
外壳材料 Shell material				金属 Metal	金属 Metal	塑料 Plastic	塑料·金属 Plastic, Metal
防护等级 Protection grade				IP54	IP54	IP54	IP54

○ 外形图例
Outward appearance illustration



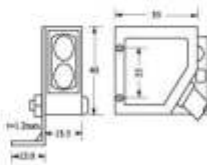
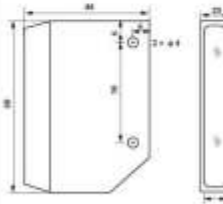
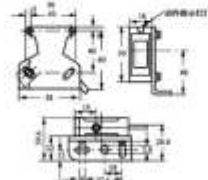
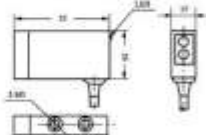
外形编号 Outward appearance code				G16	G17	G18	G23
外形尺寸 Overall dimensions							
漫反射型 Diffuse type	检测距离 Detection distance			10cm	30cm	10cm-30cm	10cm-50cm
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G16-3A10NA	G17-3A30NA	G18-3A10NA	G23-3A10NA
			NC	G16-3A10NB	G17-3A30NB	G18-3A10NB	G23-3A10NB
			NO+NC			G18-3A10NC	
		正逻辑 PNP	NO	G16-3A10PA	G17-3A30PA	G18-3A10PA	G23-3A10PA
			NC	G16-3A10PB	G17-3A30PB	G18-3A10PB	G23-3A10PB
			NO+NC			G18-3A10PC	
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO			G18-2A10LA	
		NC			G18-2A10LB		
继电器输出 Relay output							
反馈反射型 Retroreflective	检测距离 Detection distance			1m	2m	2m	2m
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G16-3B1NA	G17-3B2NA	G18-3B2NA	G23-3B2NA
			NC	G16-3B1NB	G17-3B2NB	G18-3B2NB	G23-3B2NB
			NO+NC			G18-3B2NC	
		正逻辑 PNP	NO	G16-3B1PA	G17-3B2PA	G18-3B2PA	G23-3B2PA
			NC	G16-3B1PB	G17-3B2PB	G18-3B2PB	G23-3B2PB
			NO+NC			G18-3B2PC	
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO			G18-2B2LA	
		NC			G18-2B2LB		
继电器输出 Relay output							
对射型 Trough beam	检测距离 Detection distance				3m	5m	5m
	直流 DC 10~30 VDC	负逻辑 NPN	NO		G17-3C3NA	G18-3C5NA	G23-3C5NA
			NC		G17-3C3NB	G18-3C5NB	G23-3C5NB
			NO+NC			G18-3C5NC	
		正逻辑 PNP	NO		G17-3C3PA	G18-3C5PA	G23-3C5PA
			NC		G17-3C3PB	G18-3C5PB	G23-3C5PB
			NO+NC			G18-3C5PC	
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO			G18-2C5LA	
		NC			G18-2C5LB		
继电器输出 Relay output							
输出电流 DC/SCR/ 继电器 Control output				DC: 200mA、AC: 300mA			
消耗电流 DC/AC Consumption current				DC: < 15mA、AC: < 10mA			
响应时间 DC/AC Response time				DC < 2mS、AC < 20mS			
指向角 Directional angle				3° -10°			
检测物体 Detected object				透明或不透明体 transparent or opaque body			
工作环境温度 Working environment temperature				-25℃ ~+55℃			
工作环境照度 Intensity of illumination of working environment				太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX			
外壳材料 Shell material				塑料 Plastic	塑料 Plastic	塑料 Plastic	金属 Metal
防护等级 Protection grade				IP54	IP54	IP66	IP54



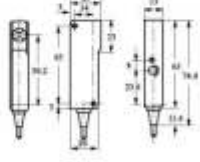
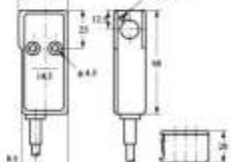
G24	G30	G33	G35	G36
				
50cm	20~100cm	10cm	50cm	20cm
G24-3A50NA	G30-3A70NA	G33-3A10NA	G35-3A50NA	G36-3A20NA
G24-3A50NB	G30-3A70NB	G33-3A10NB	G35-3A50NB	G36-3A20NB
	G30-3A70NC	G33-3A10NC	G35-3A50NC	G36-3A20NC
G24-3A50PA	G30-3A70PA	G33-3A10PA	G35-3A50PA	G36-3A20PA
G24-3A50PB	G30-3A70PB	G33-3A10PB	G35-3A50PB	G36-3A20PB
	G30-3A70PC	G33-3A10PC	G35-3A50PC	G36-3A20PC
	G30-2A70LA		G35-2A50LA	
	G30-2A70LB		G35-2A50LB	
	G30-2A70JC		G35-2A50JC	
4m	m	1m	3m	2m
G24-3B4NA	G30-3B3NA	G33-3B1NA	G35-3B3NA	G36-3B2NA
G24-3B4NB	G30-3B3NB	G33-3B1NB	G35-3B3NB	G36-3B2NB
	G30-3B3NC	G33-3B1NC	G35-3B3NC	G36-3B2NC
G24-3B4PA	G30-3B3PA	G33-3B1PA	G35-3B3PA	G36-3B2PA
G24-3B4PB	G30-3B3PB	G33-3B1PC	G35-3B3PB	G36-3B2PB
	G30-3B3PC		G35-3B3PC	G36-3B2PC
	G30-2B3LA		G35-2B3LA	
	G30-2B3LB		G35-2B3LB	
	G30-2B3JC		G35-2B3JC	
5m	0m	3m	5m	m
G24-3C5NA	G30-3C101NA	G33-3C3NA	G35-3C5NA	G36-3C5NA
G24-3C5NB	G30-3C101NB	G33-3C3NB	G35-3C5NB	G36-3C5NB
	G30-3C101NC	G33-3C3NC	G35-3C5NC	G36-3C5NC
G24-3C5PA	G30-3C101PA	G33-3C3PA	G35-3C5PA	G36-3C5PA
G24-3C5PB	G30-3C101PB	G33-3C3PB	G35-3C5PB	G36-3C5PB
	G30-3C101PC	G33-3C3PC	G35-3C5PC	G36-3C5PC
	G30-2C101LA		G35-2C5LA	
			G35-2C5LB	
	G30-2C101JC		G35-2C5JC	
DC: 200mA, AC: 300mA				
DC: < 15mA, AC: < 10mA				
DC < 2mS, AC < 20mS				
3° ~10°				
透明或不透明体 transparent or opaque body				
-25℃ ~+55℃				
太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX				
塑料 Plastic	塑料 Plastic	塑料 Plastic	金属 Metal	金属 Metal
IP54	IP66	IP54	IP54	IP54

○ 外形图例
Outward appearance illustration



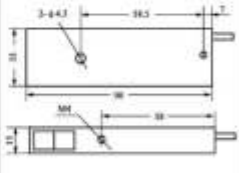
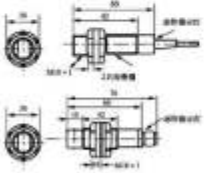
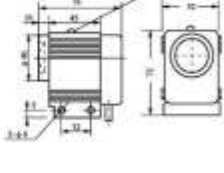
外形编号 Outward appearance code				G40	G44	G50	G54
外形尺寸 Overall dimensions							
漫反射型 Diffuse type	检测距离 Detection distance			10cm	30cm	50cm	20cm
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G40-3A10NA	G44-3A30NA	G50-3A50NA	G54-3A20NA
			NC	G40-3A10NB	G44-3A30NB	G50-3A50NB	G54-3A20NB
			NO+NC			G50-3A50NC	G54-3A20NC
		正逻辑 PNP	NO	G40-3A10PA	G44-3A30PA	G50-3A50PA	G54-3A20PA
			NC	G40-3A10PB	G44-3A30PB	G50-3A50PB	G54-3A20PB
			NO+NC			G50-3A50PC	G54-3A20PC
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
			NC				
	继电器输出 Relay output					G50-2A50JC	
反馈反射型 Retroreflective	检测距离 Detection distance				3m	5m	2m
	直流 DC 10~30 VDC	负逻辑 NPN	NO		G44-3B3NA	G50-3B5NA	G54-3B2NA
			NC		G44-3B3NB	G50-3B5NB	G54-3B2NB
			NO+NC			G50-3B5NC	G54-3B2NC
		正逻辑 PNP	NO		G44-3B3PA	G50-3B5PA	G54-3B2PA
			NC		G44-3B3PB	G50-3B5PB	G54-3B2PB
			NO+NC			G50-3B5PC	G54-3B2PC
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
			NC				
	继电器输出 Relay output					G50-2B5JC	
对射型 Trough beam	检测距离 Detection distance				5m	10m	5m
	直流 DC 10~30 VDC	负逻辑 NPN	NO		G44-3C5NA	G50-3C10NA	G54-3C5NA
			NC		G44-3C5NB	G50-3C10NB	G54-3C5NB
			NO+NC			G50-3C10NC	G54-3C5NC
		正逻辑 PNP	NO		G44-3C5PA	G50-3C10PA	G54-3C5PA
			NC		G44-3C5PB	G50-3C10PB	G54-3C5PB
			NO+NC			G50-3C10PC	G54-3C5PC
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO				
			NC				
	继电器输出 Relay output					G50-2C10JC	
输出电流 DC/SCR/ 继电器 Control output				DC: 200mA、AC: 300mA、relay: 2A			
消耗电流 DC/AC Consumption current				DC: < 15mA、AC: < 10mA			
响应时间 DC/AC Response time				DC < 2mS、AC < 20mS			
指向角 Directional angle				3° -10°			
检测物体 Detected object				透明或不透明体 transparent or opaque body			
工作环境温度 Working environment temperature				-25℃ ~+55℃			
工作环境照度 Intensity of illumination of working environment				太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LXs			
外壳材料 Shell material				金属 Metal	塑料 Plastic	塑料 Plastic	塑料 Plastic
防护等级 Protection grade				IP50	IP54	IP54	IP54



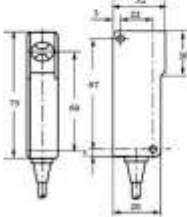
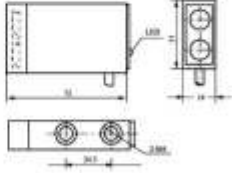
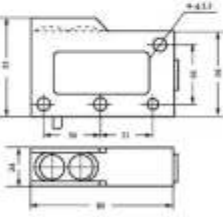
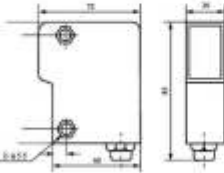
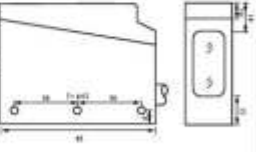
G55	G64	G68	G70	G71
				
20cm	10cm		20~100cm	50cm
G55-3A20NA	G64-3A10NA		G70-3A20NA	G71-3A50NA
G55-3A20NB	G64-3A10NB		G70-3A20NB	G71-3A50NB
	G64-3A10NC		G70-3A20NC	G71-3A50NC
G55-3A20PA	G64-3A10PA		G70-3A20PA	G71-3A50PA
G55-3A20PB	G64-3A10PB		G70-3A20PB	G71-3A50PB
	G64-3A10PC		G70-3A20PC	G71-3A50PC
2m	1.5m		2m	2m
G55-3B2NA	G64-3B2NA		G70-3B2NA	G71-3B2NA
G55-3B2NB	G64-3B2NB		G70-3B2NB	G71-3B2NB
	G64-3B2NC		G70-3B2NC	G71-3B2NC
G55-3B2PA	G64-3B2PA		G70-3B2PA	G71-3B2PA
G55-3B2PB	G64-3B2PB		G70-3B2PB	G71-3B2PB
	G64-3B2PC		G70-3B2PC	G71-3B2PC
4m	3m	5m	5m	5m
G55-3C4NA	G64-3C3NA	G68-3C5NA	G70-3C5NA	G71-3C5NA
G55-3C4NB	G64-3C3NB	G68-3C5NB	G70-3C5NB	G71-3C5NB
	G64-3C3NC	G68-3C5NC	G70-3C5NC	G71-3C5NC
G55-3C4PA	G64-3C3PA	G68-3C5PA	G70-3C5PA	G71-3C5PA
G55-3C4PB	G64-3C3PB	G68-3C5PB	G70-3C5PB	G71-3C5PB
	G64-3C3PC	G68-3C5PC	G70-3C5PC	G71-3C5PC
DC: 200mA, AC: 300mA				
DC: < 15mA, AC: < 10mA				
DC < 2mS, AC < 20mS				
3° ~10°				
透明或不透明体 transparent or opaque body				
-25℃ ~+55℃				
太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX				
金属 Metal	塑料 Plastic	塑料 Plastic	塑料 Plastic	塑料 Plastic
IP54	IP54	IP54	IP54	IP54

○ 外形图例
Outward appearance illustration



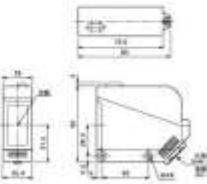
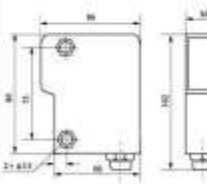
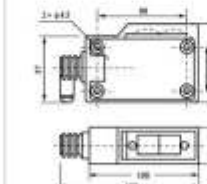
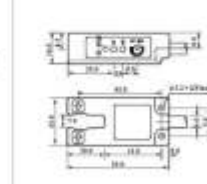
外形编号 Outward appearance code				G72	G180	G75	G76			
外形尺寸 Overall dimensions										
漫反射型 Diffuse type	检测距离 Detection distance			40cm	10cm	80cm				
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G72-3A40NA	G180-3A10NA	G75-3A80NA				
			NC	G72-3A40NB	G180-3A10NB	G75-3A80NB				
			NO+NC	G72-3A40NC	G180-3A10NC	G75-3A80NC				
		正逻辑 PNP	NO	G72-3A40PA	G180-3A10PA	G75-3A80PA				
			NC	G72-3A40PB	G180-3A10PB	G75-3A80PB				
			NO+NC	G72-3A40PC	G180-3A10PC	G75-3A80PC				
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon		NO	G180-2A10LA	G75-2A80LA				
				NC	G180-2A10LB					
		继电器输出 Relay output				G75-2A80JC				
反馈反射型 Retroreflective	检测距离 Detection distance			3m	2m	m				
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G72-3B3NA	G180-3B2NA	G75-3B3NA				
			NC	G72-3B3NB	G180-3B2NB	G75-3B3NB				
			NO+NC	G72-3B3NC	G180-3B2NC	G75-3B3NC				
		正逻辑 PNP	NO	G72-3B3PA	G180-3B2PA	G75-3B3PA				
			NC	G72-3B3PB	G180-3B2PB	G75-3B3PB				
			NO+NC	G72-3B3PC	G180-3B2PC	G75-3B3PC				
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon		NO	G180-2B2LA	G75-2B3LA				
				NC	G180-2B2LB					
		继电器输出 Relay output				G75-2B3JC				
对射型 Trough beam	检测距离 Detection distance			5m	5m	8m	10m - 50m			
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G72-3C5NA	G180-3C5NA	G75-3C8NA	G76-3C101NA			
			NC	G72-3C5NB	G180-3C5NB	G75-3C8NB	G76-3C101NB			
			NO+NC	G72-3C5NC	G180-3C5NC	G75-3C8NC	G76-3C101NC			
		正逻辑 PNP	NO	G72-3C5PA	G180-3C5PA	G75-3C8PA	G76-3C101PA			
			NC	G72-3C5PB	G180-3C5PB	G75-3C8PB	G76-3C101PB			
			NO+NC	G72-3C5PC	G180-3C5PC	G75-3C8PC	G76-3C101PC			
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon		NO	G180-2C5LA	G75-2C8LA	G76-2C101LA			
				NC	G180-2C5LB					
		继电器输出 Relay output				G75-2C8JC	G76-2C101JC			
输出电流 DC/SCR/ 继电器 Control output				DC: 200mA, AC: 300mA, relay: 2A						
消耗电流 DC/AC Consumption current				DC: < 15mA, AC: < 10mA						
响应时间 DC/AC Response time				DC < 2mS, AC < 20mS						
指向角 Directional angle				3° - 10°						
检测物体 Detected object				透明或不透明体 transparent or opaque body						
工作环境温度 Working environment temperature				-25°C ~ +55°C						
工作环境照度 Intensity of illumination of working environment				太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX						
外壳材料 Shell material				金属 Metal	塑料 Plastic	金属 Metal	塑料 Plastic			
防护等级 Protection grade				IP50	IP66	IP54	IP54			

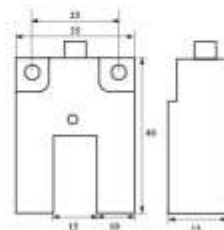
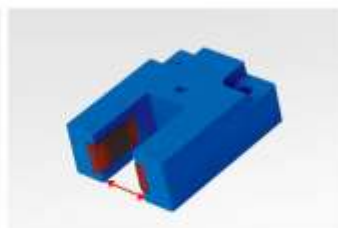


G77	G78	G80	G85	G86
				
30cm	40cm	80cm	1m	70cm
G77-3A30NA	G78-3A40NA	G80-3A80NA	G85-3A1NA	G86-3A70NA
G77-3A30NB	G78-3A40NB	G80-3A80NB	G85-3A1NB	G86-3A70NB
G77-3A30NC	G78-3A40NC	G80-3A80NC	G85-3A1NC	G86-3A70NC
G77-3A30PA	G78-3A40PA	G80-3A80PA	G85-3A1PA	G86-3A70PA
G77-3A30PB	G78-3A40PB	G80-3A80PB	G85-3A1PB	G86-3A70PB
G77-3A30PC	G78-3A40PC	G80-3A80PC	G85-3A1PC	G86-3A70PC
G77-2A30LA	G78-2A40LA	G80-2A80LA	G85-2A1LA	G86-2A70LA
		G80-2A80JC	G85-2A1JC	G86-2A70JC
3m	2m	m	5m	4m
G77-3B3NA	G78-3B2NA	G80-3B3NA	G85-3B5NA	G86-3B4NA
G77-3B3NB	G78-3B2NB	G80-3B3NB	G85-3B5NB	G86-3B4NB
G77-3B3NC	G78-3B2NC	G80-3B3NC	G85-3B5NC	G86-3B4NC
G77-3B3PA	G78-3B2PA	G80-3B3PA	G85-3B5PA	G86-3B4PA
G77-3B3PB	G78-3B2PB	G80-3B3PB	G85-3B5PB	G86-3B4PB
G77-3B3PC	G78-3B2PC	G80-3B3PC	G85-3B5PC	G86-3B4PC
G77-2B3LA	G78-2B2LA	G80-2B3LA	G85-2B5LA	G86-2B4LA
		G80-2B3JC	G85-2B5JC	G86-2B4JC
5m	5m	5m	10m	10m
G77-3C5NA	G78-3C5NA	85-3B5NA	G85-3C101NA	G86-3C101NA
G77-3C5NB	G78-3C5NB	85-3B5NB	G85-3C101NB	G86-3C101NB
G77-3C5NC	G78-3C5NC	85-3B5NC	G85-3C101NC	G86-3C101NC
G77-3C5PA	G78-3C5PA	85-3B5PA	G85-3C101PA	G86-3C101PA
G77-3C5PB	G78-3C5PB	85-3B5PB	G85-3C101PB	G86-3C101PB
G77-3C5PC	G78-3C5PC	85-3B5PC	G85-3C101PC	G86-3C101PC
G77-2C5LA	G78-2C5LA	85-2B5LA	G85-2C101LA	G86-2C101LA
		G80-2C5JC	G85-2C101JC	G86-2C101JC
DC: 200mA, AC: 300mA				
DC: < 15mA, AC: < 10mA				
DC < 2mS, AC < 20mS				
3° -10°				
透明或不透明体 transparent or opaque body				
-25℃ ~+55℃				
太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX				
塑料 Plastic	塑料 Plastic	塑料 Plastic	金属 Metal	金属 Metal
IP54	IP54	IP54	IP54	IP54

○ 外形图例
Outward appearance illustration



外形编号 Outward appearance code				G74	G100	G139	G56
外形尺寸 Overall dimensions							
漫反射型 Diffuse type	检测距离 Detection distance			70cm	1m	1m	
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G74-3A70NA	G100-3A1NA	G139-3A1NA	
			NC	G74-3A70NB	G100-3A1NB	G139-3A1NB	
			NO+NC	G74-3A70NC	G100-3A1NC	G139-3A1NC	
		正逻辑 PNP	NO	G74-3A70PA	G100-3A1PA	G139-3A1PA	
			NC	G74-3A70PB	G100-3A1PB	G139-3A1PB	
			NO+NC	G74-3A70PC	G100-3A1PC	G139-3A1PC	
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO		G100-2A1LA	G139-2A1LA	
			NC				
继电器输出 Relay output			G74-2A70JC	G100-2A1JC	G139-2A1JC		
反馈反射型 Retroreflective	检测距离 Detection distance			5m	5m	5m	
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G74-3B5NA	G100-3B5NA	G139-3B5NA	
			NC	G74-3B5NB	G100-3B5NB	G139-3B5NB	
			NO+NC	G74-3B5NC	G100-3B5NC	G139-3B5NC	
		正逻辑 PNP	NO	G74-3B5PA	G100-3B5PA	G139-3B5PA	
			NC	G74-3B5PB	G100-3B5PB	G139-3B5PB	
			NO+NC	G74-3B5PC	G100-3B5PC	G139-3B5PC	
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO		G100-2B5LA	G139-2B5LA	
			NC				
继电器输出 Relay output			G74-2B5JC	G100-2B5JC	G139-2B5JC		
对射型 Trough beam	检测距离 Detection distance			15m	10m	10m	1cm
	直流 DC 10~30 VDC	负逻辑 NPN	NO	G74-3C15NA	G100-3C101NA	G139-3C101NA	G56-3E01NA
			NC	G74-3C15NB	G100-3C101NB	G139-3C101NB	G56-3E01NB
			NO+NC	G74-3C15NC	G100-3C101NC	G139-3C101NC	G56-3E01NC
		正逻辑 PNP	NO	G74-3C15PA	G100-3C101PA	G139-3C101PA	G56-3E01PA
			NC	G74-3C15PB	G100-3C101PB	G139-3C101PB	G56-3E01PB
			NO+NC	G74-3C15PC	G100-3C101PC	G139-3C101PC	G56-3E01PC
	交流 AC 90~250 VAC	SCR 可控硅 Control-lable silicon	NO		G100-2C101LA	G139-2C101LA	
			NC				
继电器输出 Relay output			G74-2C15JC	G100-2C101JC	G139-2C101JC		
输出电流 DC/SCR/ 继电器 Control output				DC: 200mA、AC: 300mA、relay: 2A			
消耗电流 DC/AC Consumption current				DC: < 15mA、AC: < 10mA			
响应时间 DC/AC Response time				DC < 2mS、AC < 20mS			
指向角 Directional angle				3° ~10°			
检测物体 Detected object				透明或不透明体 transparent or opaque body			
工作环境温度 Working environment temperature				-25℃ ~+55℃			
工作环境照度 Intensity of illumination of working environment				太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX			
外壳材料 Shell material				塑料 Plastic	金属 Metal	铝壳 / 塑料	塑料 Plastic
防护等级 Protection grade				IP54	IP54	IP54	IP54



2cm

G57-3E02	NA
G57-3E02	NB
G57-3E02	PA
G57-3E02	PB

DC: 200mA, AC: 300mA
DC: < 15mA, AC: < 10mA
DC < 2mS, AC < 20mS

透明或不透明体 transparent or opaque body

-25°C ~ +55°C

太阳光 10000LX 以下 Sunlight under 10000LX 白炽灯 3000LX 以下 incandescent lamp under 3000LX

塑料 Plastic

IP54

■ 光电传感器 G50 系列 Photo Sensor(G50 Series)

型号 Model	G50-4C10JC	G50-4B5JC	G50-4A50JC
种类 Type: 任意电源、继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam  [W18xH50xL50mm] NEW	镜面反射型(*1) Retroreflective(*1)  NEW	漫反射型 Diffuse type  NEW
检测距离 Detecting distance	10m	0.1~5m	500mm(100x100mm 白色无光纸) 500mm(100x100mm Non glossy white paper)
检测物体 Detecting target	φ16mm 以上的非透明体 paque materials of Min.φ16mm	φ60mm 以上的非透明体 paque materials of Min.φ60mm	非透明体、半透明体、透明体 Transpqrnt,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	AC24~240V ± 10% 50/60Hz, DC24~240V ± 10% (波纹 P-P: 10% 以下) 24to240VAC ± 10% 50/60Hz, 24to240VDC ± 10% (Ripple P-P: Max10%)		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output 接点容量: DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load, 250VAC 3A Resistive load 接点组成: 1C Contact orde: 1C		
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting cistance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

型号 Model	G50-3C10JC	G50-3B5JC	G50-3A50JC
种类 Type: 任意电源、继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam  [W18xH50xL50mm] NEW	镜面反射型(*1) Retroreflective(*1)  NEW	漫反射型 Diffuse type  NEW
检测距离 Detecting distance	10m	0.1~5m	500mm(100x100mm 白色无光纸) 500mm(100x100mm Non glossy white paper)
检测物体 Detecting target	φ16mm 以上的非透明体 paque materials of Min.φ16mm	φ60mm 以上的非透明体 paque materials of Min.φ60mm	非透明体、半透明体、透明体 Transpqrnt,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	DC10~30V		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output 接点容量: DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load, 250VAC 3A Resistive load 接点组成: 1C Contact orde: 1C		
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting cistance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

■ 光电传感器 G50 系列 Photo Sensor(G50 Series)

型号 Model	G50-2C10JC	G50-2B5JC	G50-2A50JC
种类 Type: 任意电源,继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam  [W18xH50xL50mm]	镜面反射型(*1) Retroreflective(*1) 	漫反射型 Diffuse type 
检测距离 Detecting distance	10m	0.1~5m	500mm(100x100mm 白色无光纸) 500mm(100x100mm Non glossy white paper)
检测物体 Detecting target	ø16mm 以上的非透明体 paque materials of Min.ø16mm	ø60mm 以上的非透明体 paque materials of Min.ø60mm	非透明体、半透明体、透明体 Transpquent,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	AC90~250V		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output 接点容量: DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load,250VAC 3A Resistive load 接点组成: 1C Contact orde: 1C		
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting distance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

■ 光电传感器 G74 系列 Photo Sensor(G74 Series)

型号 Model	G74-4C15JC	G74-4B5JC	G74-4A70JC
种类 Type: 任意电源,继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam  [W25xH67xL81mm]	镜面反射型(*1) Retroreflective(*1) 	漫反射型 Diffuse type 
检测距离 Detecting distance	15m	0.1~5m	700mm(100x100mm 白色无光纸) 700mm(100x100mm Non glossy white paper)
检测物体 Detecting target	ø16mm 以上的非透明体 paque materials of Min.ø16mm	ø60mm 以上的非透明体 paque materials of Min.ø60mm	非透明体、半透明体、透明体 Transpquent,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	AC24~240V ± 10%/50/60Hz,DC24~240V ± 10%(波纹 P-P: 10% 以下) 24to240VAC ± 10%/50/60Hz,24to240VDC ± 10%(Ripple P-P: Max10%)		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output 接点容量: DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load,250VAC 3A Resistive load 接点组成: 1C Contact orde: 1C		
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting distance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

■ 光电传感器 G74 系列 Photo Sensor(G74 Series)

型号 Model	G74-3C15JC	G74-3B5JC	G74-3A70JC
种类 Type: 任意电源、继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam  [W25xH67xL81mm] 	镜面反射型(*1) Retroreflective(*1)  	漫反射型 Diffuse type  
检测距离 Detecting distance	15m	0.1-5m	700mm(100x100mm 白色无光纸) 700mm(100x100mmNon glossy white paper)
检测物体 Detecting target	ø16mm 以上的非透明体 paque materials of Min.ø16mm	ø60mm 以上的非透明体 paque materials of Min.ø60mm	非透明体、半透明体、透明体 Transpqrnt,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	DC10-30V		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output	接点容量 : DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load,250VAC 3A Resistive load 接点组成 : 1C Contact orde; 1C	
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting distance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

型号 Model	G74-2C15JC	G74-2B5JC	G74-2A70JC
种类 Type: 任意电源、继电器接点输出 型 Free voltage,Relay contact output 外形尺寸 Appearances & dimensions	透过型 Through beam   [W25xH67xL81mm]	镜面反射型 (*1) Retroreflective(*1)  	漫反射型 Diffuse type  
检测距离 Detecting distance	15m	0.1-5m	700mm(100x100mm 白色无光纸) 700mm(100x100mmNon glossy white paper)
检测物体 Detecting target	ø16mm 以上的非透明体 paque materials of Min.ø16mm	ø60mm 以上的非透明体 paque materials of Min.ø60mm	非透明体、半透明体、透明体 Transpqrnt,Translucent,Opaque materials
滞后距离 Hysterisis	不大于检测距离的 20% Max.20% at detecting distance		
响应速度 Response time	20mS 以下 Max.20mS		
电源电压 Power voltage	AC90-250V		
调节灵敏度 Sensitivity	内置调节灵敏度的 VR Adjustable by VR		
工作模式 Operating mode	通过切换开关选择 Light ON/Dark ON 模式 Selectable Light ON/D or Dark ON by slide switch		
控制输出 Control output	●继电器输出 Relay contact output	接点容量 : DC 30V 3A 阻抗负载、AC 250V 3A 阻抗负载 Capacity: 30VDC 3A Resistive load,250VAC 3A Resistive load 接点组成 : 1C Contact orde; 1C	
防护等级 Protection	IP54(IEC 规格) IP54(IEC Standard)		

(*1) 镜面反射型的检测距离和检测物体是反射镜 MS-2 的值。同时, 检测距离表示反射镜的可设置范围。在 0.1 米以内也可以检测物体

(*1) Detecting distance and detecting target of retroreflective type is the value for MS-2 and detecting distance shows available setting range of MS-2,It is able to detect the target at under 0.1m.

■ GR 系列通用放大器内藏型光电开关 GR Series General Amplifier Built-in Photoelectric Switch

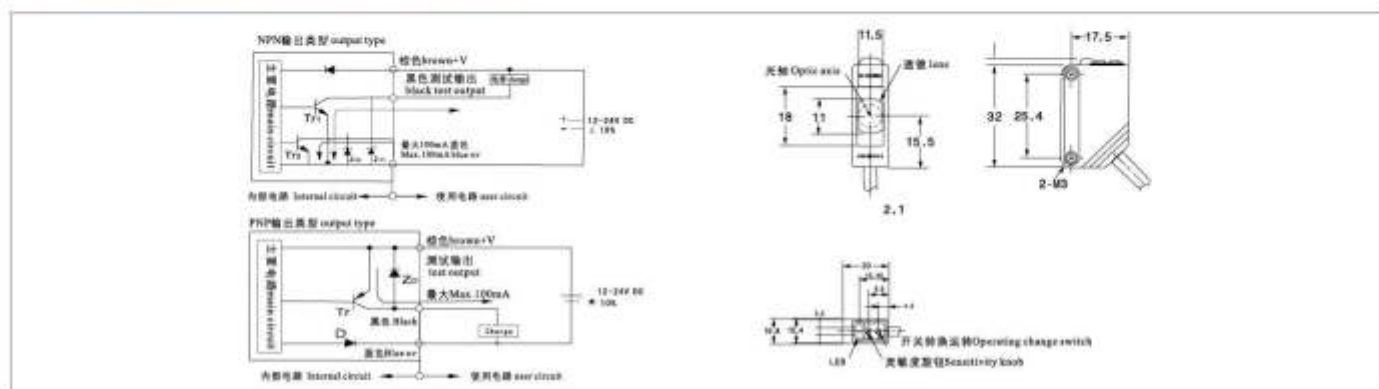
- 最适用于物流装置的通用光电开关
Most suitable for general photoelectric switch
- 标准偏光的镜片反射型
Standard Polarized lenses reflective type
- 长距离检测对照型: 10m 反射型: 0.8m 偏光镜片反射型: 2m
Long-distance scanning contrast type: 10m
Diffused reflection: 0.8m polarized lenses reflective type: 2m
- 全球范围 (EN 规格产品) (备有 NPN, PNP) 适用
Suitable for EN product (with PNP and NPN) in the world
- CRA-30 国内制造, 更有价格优势
CRA30 domestic manufacturing, and more price advantage



■ 技术参数 Technical parameters

	长距离对照型 Long-distance contrast type	对照型 Contrast type	短距离反射型 Short-distance contrast type	漫反射型 Diffused reflection	宽光束漫反射开型 wide beam diffused reflection type	长距离反射型 Long-distance reflective type
型号 Model	GR-1000/GR-1000P	GR-500/GR-500P	GR-200/GR-200P	GR-10/GR-10P	GR-40/GR-40P	GR-80/GR-80P
电源电压 Power supply	12-24 V ± 10 % 的波动			12-24V ± 10% Fluctuation		
消耗电流 Consumption current	Below 55mA light receiver 30mA, receiver 25mA		< 30mA Less than 30mA	< 30mA Less than 30mA	< 30mA Less than 30mA	< 30mA Less than 30mA
检测距离 Scanning distance	10m	5m	2m 反射型 (reflective type)	1-100mm	400mm	800mm
标准检测物 Standard sensing object	φ9mm		φ60mm(反射型 reflective type)			
指向角 Angle of direction	—		—	10 × 10cm 白纸 (white paper)	20 × 20cm 白纸 (white paper)	20 × 20cm 白纸 (white paper)
响应输出 Response Output	移动和复位小于 1ms Movement and reposition less than 1ms					
受光面照度 Smooth the illumination	白炽灯: 小于 5000Lux 阳光: 小于 20000Lux Incandescent lamp: less than 5,000 Lux; sunlight: less than 20,000 Lux					
使用温度范围 use of humidity range	-20~+70℃ 没有结冰和结露 no frosting and condensation					
使用湿度范围 use of humidity range	35-85%RH					
绝缘电阻 Insulated resistance	>20MΩ					
耐电压 voltage resistance	AC1000V 50/60Hz					
抗振动 vibration resistance	10-55hz 高峰 1.5 毫米对 x, y 和 z 分别为 2 小时 10-55Hz peak 1.5mm towards X, Y and Z respectively for 2 hours					
抗冲击 concussion resistance	500m/s ² 分别对 x, y, z towards X, Y and Z respectively.					
保护等级 protection level	IP66 (IEC specification)					
电路保护 circuit protection	防止错误输出时, 电源供应器储备连接的保护, 通过 / 截止 (约 100 ms) revent error output when power supply is reserve connecting protection ,through/cutoff(approximately 100ms)					

■ 产品说明图 Explanation of the product



■ 接线图 Connection diagram

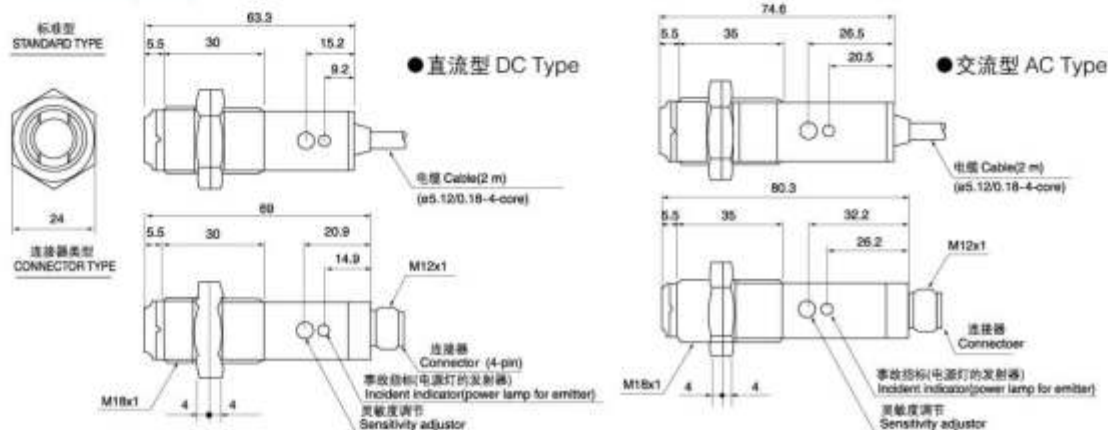
直流型 DC type	褐色 Brown, ①	直流 DC 10~30V	●标准型 Standard type
	蓝色 Blue, ③	过压 OV	
	黑色 Black, ④	最大输出 100mA Output 100mA max. 试验投入 TEST INPUT for emittet	
	白色 White, ②	连接到 Connected to(Brown, ①)-LIGHT ON 连接到 Connected to (Blue, ③)-DARK ON	
交流型 AC type	褐色 Brown, ①	交流 AC 22~240V	●连接器类型 Connector type
	蓝色 Blue, ②		
	黑色 Black, ③		
		最大输出 250mA Output 250mA max.	



■ 规格 Specifications

型号 Type 项目 Item	直流型 DC type					交流型 DC type						
	通过梁式 Through beam type	回归反射 型 Retro- reflection type	与偏振过滤器 With polarizing filter	漫反射型 Diffused reflection type		通过梁式 Through beam type	回归反射 型 Retro- reflection type	与偏振过滤器 With polarizing filter	漫反射型 Diffused reflection type			
	GTD-1500(C) (N,P)	GTD-300(C) (N,P)	GRDF-100(C) (N,P)	GDD-11(C) (N,P)	GDD-40(C) (N,P)	GTA-1500(C) (L,D)	GTD-300(C) (L,D)	GRAF-100(C) (L,D)	GDA-11(C) (L,D)	GDA-40(C) (L,D)		
检测距离 Detecting distance	15m	0.05-3m	0.05-1m	※11cm	※40cm	15m	0.05-3m	0.05-1m	※11cm	※40cm		
供电电压 Supply voltage	DC 10-30V					AC 22-240V ± 10%					50/60Hz	
消耗电流 Current consumption	40mA max.	30mA max.				10mA max.	5mA max.					
检测物体 Detecting object	不透明物体 Opaque object □ 15mm min.	不透明物体 Opaque object □ 45mm min.	透明和不透明物体 Transparent and opaque object □ 15mm min.			不透明物体 Opaque object □ 15mm min.	不透明物体 Opaque object □ 45mm min.	透明和不透明物体 Transparent and opaque object □ 15mm min.				
响应时间 Response time	1.5ms max.					15ms max.						
滞后 Hysteresis						15%max.(at11cm) 20%max.(at40cm)						15%max.(at11cm) 20%max.(at40cm)
光源 Light source	红外灯 IRLED		红色灯 Red LED		红外灯 IR LED			红色灯 Red LED		红外灯 IR LED		
灵敏度调整 Sensitivity adjustment	旋转量 rotation volume		旋转量 rotation volume				旋转量 rotation volume		旋转量 rotation volume			
指标 Indicator	事故指标 (红) Incident Indicator(Red)					发射功率指标 Power indicator for emitter						
控制输出 Control output	DPN 或 PNP 集电极开路最大 100mA, 直流 DC30V NPN 或 PNP open collector 100mA max. DC30V					FET 输出 250mA 最大交流 240V FET output 250mA max.AC 240V						
操作模式 Operation mode	光照对, 不清楚可选择控制电缆 LIGHT ON, DARK ON selectable by control cable					光照对, 键入或暗型 LIGHT ON, type or DARK ON type						
连接 Connection	电缆: 聚氯乙烯 5x2mx, 4x0.3mm ² 连接器: M12x4 引脚 Cable:PVC 5x2m, 4x0.3mm ² Connector:M12x4 Pins					电缆: 聚氯乙烯 5x2mx, 3x0.3mm ² 连接器: M12x4 引脚 Cable: PVC 5x2m, 3x0.3mm ² Connector: M12x4 pins						
噪音电阻 Noise resistance	100 Vp, 脉冲宽度 1 秒 (噪声模拟器) 100 Vp, pulse width 1μs(Noise simulator)											
绝缘电阻 Insulation resistor	20MΩ 分钟, (在 DC500V) 20MΩ min.(at DC500V)											
环境温度湿度 Ambient temperature humidity	-25-55℃ (不应该有任何冻结) 35-85%RH -25-55℃ (There should be no freezing) 35-85%RH											
环境照度 Environmental illuminance	日光: 10000 / x 最高。白炽灯: 3000lx 最高。 Sunlight:10000/x max. Incandescent lamp:3000lx max.											
振动冲击性能 Vibration Shock resistance	振动: 10 - 5Hz 振幅 1.5mm X.Y.Z, 每 2 小时。冲击: 500m/x ² (50 克) X.Y.Z, 每 3 倍 Vibration:10-55Hz Amplitude 1.5mm X.Y.Z,each 2 hrs. Shock:500m/x ² (50G) X.Y.Z,each 3 times											
保护类材料 Protection category material	IP66(IEC 144) 案例: BSBM 镜头: 郎编 (聚甲基丙烯酸甲酯的偏光过滤器类型) IP66(IEC 144) Case:BSBM Lens:PC(PMMA for polarizing filter type)											

■ 尺寸 Dimensions(mm)



■ 安全可靠的光幕传感器

Safe and reliable optic screen sensor

- 适用于自动化流水线、电梯、危险禁区、锻压机、冲剪机床、切纸机等安全检测，起保护作用。
- 采用同步扫描技术，光路密集，无工作盲区，抗干扰能力强，安装方便。
- 具备抗相互干扰功能，可以2套以上紧贴安装。
- 具有故障自检功能、掉电停止、内部器件失灵停止、连接失灵停止、物体入侵停止信号输出。
- 配套专用控制器，提供强大的控制功能。
- 可与 SICK、STI、KEYENCE、Honeywell 等公司同类产品互换。
- Applicable for the safety detection of automatic assembly line, elevator, danger restricted zone, metal forming machine, punching & shearing machine tool, paper cutter and so on and has protection function.
- Adopting synchronism scanning technology, concentrated beam path, non working blind area, strong anti-interference ability, and convenient installation.
- Resistance to mutual interference function. It is possible to closely mount more than 2 sets of devices.
- Fault self-check, function, power failure stop, inner component fault stop, connection fault stop, object invading stop signal output.
- Attached with specific control supplying powerful control function.
- Replaceable for similar products made by SICK, STI, KEYENCE, Honeywell Corp.



检测方式 Detection way	型 号 Model	检测距离 Detection distance	光轴距 Optic axis distance	光轴数 Optic axis number	检测幅宽 Detection width	最小可检出物体 Min. detectable object
对射式 Trough-beam	GM40-4	≤ 3m	40mm	4	120mm	ø50mm
	GM40-6			6	200mm	
	GM40-8			8	280mm	
	GM40-10			10	360mm	
	GM40-12			12	440mm	
	GM40-16			16	600mm	
	GM40-20			20	760mm	
	GM40-24			24	920mm	
	GM40-32			32	1240mm	
	GM40-40			40	1560mm	
	GM40-56			56	2200mm	
	GM40-64			64	2520mm	
对射式 Trough-beam	GM20-4	≤ 3m	20mm	4	60mm	ø30mm
	GM20-6			6	100mm	
	GM20-8			8	140mm	
	GM20-10			10	180mm	
	GM20-12			12	220mm	
	GM20-16			16	300mm	
	GM20-20			20	380mm	
	GM20-24			24	460mm	
	GM20-32			32	620mm	
	GM20-40			40	780mm	
	GM20-56			56	1100mm	
	GM20-64			64	1260mm	

■ GM 光幕传感器 GM optic screen sensor

● 性能 Performance

电源电压 Power voltage	12~24VDC
消耗电流 Consumption current	100mA 以下 Under 100mA
响应时间 Response time	20mS 以下 Under 20mS
输出形式 Output form	集电极开路 NPN 型: 漏电流 100mA, 残余电压 1.6V Collector open circuit NPN type: current 100mA, residual voltage 1.6V
输出状态 Output state	所有光轴受光时 ON ON when all the optic axis is photic
光源 Optic source	红外线 LED Infrared ray LED
连接方式 Connection way	配专用电缆连接器 With specific cable connector
壳体材料 Shell material	外壳: 铝合金, 滤色罩: PMMA Shell: A1 alloy, color filter cover: PMMA
耐环境光 Environment-resisting light	白炽灯: 受光面照度 3000Lx, 太阳光: 受光面照度 10000Lx Incandescent lamp: intensity of illumination of photic surface 3000Lx, sunlight: intensity of illumination of photic surface 10000Lx
环境温度 Ambient temperature	工作时: -10~50° (但不结冰), 存储时: -40~70° -10~55(do not freeze)while working -40~70 while storing
环境湿度 Environment humidity	工作时: 35~85%RH, 存储时: 35~95%RH 35~85%RH while working, 35~39%RH while storing
振动 Vibration	振动频率: 10~50Hz, 振动幅度: 1.5mm, X、Y、Z 方向各 2 小时 Vibration frequency: 10~55Hz, vibration range: 1.5mm, each direction of X、Y、Z for 3 hours
冲击 Shock	加速度: 500/s ² (约 50g)X、Y、Z 方向各 3 次 Acceleration: 500/s ² (about 50g) each direction of X、Y、Z for 3 hours

● 控制器性能

型 号 TYPE	GMK 光幕控制器
电源电压 Power voltage	200~220VAC ± 10%, 50/60Hz, 3.5VA
消耗电流 Consumption current	100mA 以下
响应时间 Response time	20mS 以下
输出 Output	触点: COSφ=1, AC250V5A, 常开常闭
光源 Optic source	红外 LED
延时功能	0.01~5S 延时接通, 接通延时
指示灯	电源指示灯 (G), 动作指示灯 (R)
壳体材料 Shell material	ABS
环境温度 Ambient temperature	工作时: 10~55° (但不结冰), 存储时: -40~70°
环境湿度 Environment humidity	工作时: 35~85%RH, 存储时: 35~95%RH
振动 Vibration	振动频率: 10~55Hz, 振动幅度: 1.5mm, X、Y、Z 方向各 2 小时
冲击 Shock	加速度: 500/s ² (约 50g)X、Y、Z 方向各 3 次 Acceleration: 500/s ² (about 50g), 3 times for X、Y、Z each.

● 电缆连接器 cable connector

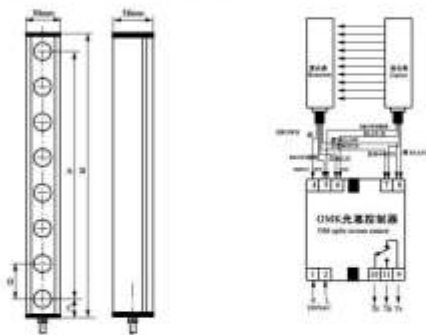
外 形 Overall	型 号 Type	长 度	用 途 Application
	○ GML-5-4	5m	四芯投光器使用 For four-core projector
	○ GML-5-5	5m	五芯受光器使用 For five-core projector

● 单位 :Unit:mm

型号 TYPE	A	B	C	D
GM40-4	120	180	30	40
GM40-6	200	260	30	40
GM40-8	280	340	30	40
GM40-10	360	420	30	40
GM40-12	440	500	30	40
GM40-16	600	660	30	40
GM40-20	760	820	30	40
GM40-24	920	980	30	40
GM40-32	1240	1300	30	40
GM40-40	1560	1620	30	40
GM40-56	2200	2260	30	40
GM40-64	2520	2580	30	40

型号 TYPE	A	B	C	D
GM20-4	60	120	30	20
GM20-6	100	160	30	20
GM20-8	140	200	30	20
GM20-10	180	240	30	20
GM20-12	220	280	30	20
GM20-16	300	360	30	20
GM20-20	380	440	30	20
GM20-24	460	520	30	20
GM20-32	620	680	30	20
GM20-40	780	840	30	20
GM20-50	1100	1160	30	20
GM20-60	1260	1320	30	20

● 外型尺寸 Overall dimensions

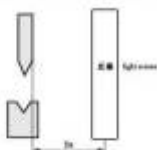


■ GM 光幕传感器 GM optic screen sensor

GMK 控制器底座端子 GMK light seen control	投光器电缆 Light receiver Cable	受光器电缆 Projector Cable
1: 220VAC (N) 输入 1: 220VAC(N)Input		
2: 220VAC (L) 输入 2: 220VAC(N)Input		
3: 空脚 empty pin		
4: 光幕信号输入 (IN) input of light screen signal(IN)		
5: 正极 Anode	棕色线 (1)BROWN	棕色线 (1)BROWN
6: 负极 Cathode	蓝色线 (2)BLUE	蓝色线 (2)BLUE
7: SY	白色线 (3)WHITE	白色线 (3)WHITE
8: R	黑色线 (4)BLACK	黑色线 (4)BLACK
9: 继电器常闭点 Relay NC point		灰色线 (5)GRAY
10: 继电器公共点 relay common point		
11: 继电器常开点 relay NO point		

■ 正确使用 Use correctly

- 最小光幕安装安全距离 D_s
Min. safe installation distance of light screen D_s



$$D_s = KX(T_s + T_c + T_t + T_{bm}) + D_d$$

D_s : 最小光幕安装安全距离, 指光幕检测区到危险区最近一点的距离, 单位: m。

D_s : Min. safe installation distance of light screen denotes the shortest distance from detection area of light screen to danger area in Manual speed is usually set at 1. M.

K : 手速, 一般取 1.6ms, 实例中指操作者的手从常态启动向工作点移动的速度。

K .ms. In practical example, it denotes speed of operator's hand moving to work point from normal start state.

T_s : 机器停止下压所需的最大时间, 单位: S。

T_s : Time for machine to stop depressing in S.

T_c : 机器控制器到机器制动反应所需的时间, 单位: S。

T_c : Time from control to braking reaction of machine in S

T_t : 光幕响应需要的时间, 单位: S。

T_t : Time for the light screen to react in S.

T_{bm} : 制动器所需的时间, 单位: S。 D_d

T_{bm} : Time that the brake needs in S. D_d

$$D_s = KX(T_s + T_c + T_t + T_{bm}) + D_d$$

$D_d = 1.2m - (0.4 \times H)$, D_d 最小取 0.8m。

H : 光幕检测区最低离地高度, 单位: m。

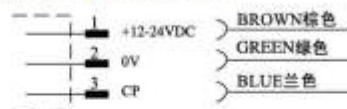
注意: 光幕水平安装角度必须小于 30° 。

H : Min. distance from light screen detection area to ground in m.

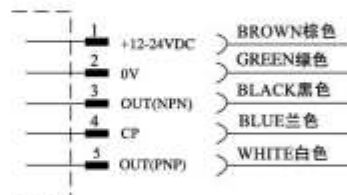
Note: Horizontal installation angle of light screen shall be less than 30°

■ 接线示意图 Connector schematic

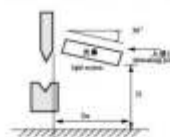
- GM 投光器
Projector



- GM 受光器
light receiver



- 水平安装光幕时最小安全距离: D_s
Min. safe distance for horizontally installing light screen: D_s



■ 注意事项 Notes:

- GM 系列光幕仅限于室内使用。
 - 光幕与高压线、动力线要分别配线或单独配管, 以免强电感应产生误动作。
 - 避免腐蚀性气体、灰尘较多、振动严重和水、油、药剂直接溅散的场所以及太阳光直射的场所。
 - 本资料若有更改宽恕不另行通知。
 - GM series light screen is only for indoor use.
 - Light screen, high voltage wire and power line shall be connected or piped separately, to avoid wrong action due to high electric induction.
 - To avoid occasions such as full of corrosive gas, too much dust, severe vibration, directly sprayed by water, oil or medicament or direct sunlight.
 - No separate notice for any change of the information in the future.
 - 检查光幕 light screen
沧巴匪虾蟮 用检测物体遮断光幕检测区域的中央、底部、边缘和顶部, 同时检测光幕输出状态是否正常。
- After installation, shutoff the center, bottom, edge and top of detection area of the light screen with the detected object, and meanwhile detect that whether the output state of light screen is normal.

■ 面板控制 Control Panel

- 输出 OUT 指示灯（绿色）
绿色灯显示输出状态。
 - 预备 READY 指示灯（黄色）
在工作期间，黄色指示灯常亮表示正处于正常工作状态；快速闪烁则表示输出。
 - 延迟 DELAY 指示灯（红色）
红色灯亮表示延时功能已激活。
 - MARK  色标按钮
当按压 MARK  色标按钮时开始进行色标的示数。
 - BKGD  背景按钮
当按压 BKGD  背景按钮时开始进行背景的示数。
- 请参考“设定”部分的设备步骤说明。

- Output indicator light (Green) Green light shows output state
- Ready indicator light (Yellow)
- Yellow light shows normally on shows it work normally in the cause of work, if stwinkle quickly means overload output.
- Delay indicator light (Red) Red light on means delay function is activated .
- Mark Button It starts to teach the color mark when press the “MARK” button.
- BKGD Button It starts to teach the background when press the “BKGD” button .



■ 技术参数 Parameter

电源电压 Supply voltage	10...30Vdc
电源波纹 Power ripple	2Vpp 最大 Max:2vpp
耗电量（不包括输出电流） Power consumption(exclude current output)	在 24Vcc 时为 50mA 最大 Max:50mA when is 24Vcc
输出信号 Output singal	1 路 PNP 输出，1 路 NPN 输出 PNP and NPN
输出电流 Output current	100mA 最大 Max: 100mA
输出饱和电压 Output Saturation voltage	≤ 2V
响应时间 Response time	33 μ s
开关频率 Switch frequency	15KHz
延时 Delay	0/20ms 可选（出厂设定为不延时） 0/20ms optional (factory set to don' t delay)
状态指示 Status indicator	输出指示灯（绿色）/ 准备指示灯（黄色）/ 延时指示灯（红色） Output indicator(green)ready indicator(yellow)delay incicator(red)
按键 Press button	色标按钮  、背景按钮  “MARK” button ,” BKGD” button
亮通 / 暗通选择 Liangtong/Antong optional	自动（出厂设定为亮通模式） Automatically (factory setting is Liangtong)
工作温度 Work temperature	-10...55℃
储存温度 Storage temperature	-20...70℃
绝缘强度 Dielectric strength	500Vac1 分钟，在电器和外壳之外 500 Vac/minute,between appliance and shell
绝缘阻抗 Insulation resistance	>200M Ω 500Vdc，在电器和外壳之外 >20M,500Vdc,between appliance and shell
检测距离 Detection distance	10mm ± 3mm
最小光斑尺寸 Min spot size	10mm 时为 1.5 × 5mm 1.5x5mm when is 10mm
光源类型 Light source type	蓝色（465nm）/ 绿色（520nm）/ 红色（630nm）自动选择 Blue(465nm)Green(520nm)Red(630nm)Auto selection
环境光抑制 Ambient light inhibition	依照 N60947-5-2 According to EN60947-5-2
振动 Shaking	0.5mm 振幅，10...55Hz，在每个方向（EN60068-2-6） 0.5mm amplitude, 10...55HZ frequency,all direction(EN60068-2-6)
冲击 Impact	11ms（30G），6 次冲击，在每个方向（EN60068-2-27） 11ms(30G),6 impact,all direction(EN60068-2-27)
外壳材质 Shell material	ABS
镜头材质 Lens material	PMMA
机械保护等级 Machancial prduction grade	IP67
连接方式 Connection type	M12-4 针连接座
重量 Weight	90g 最大 Max 90g

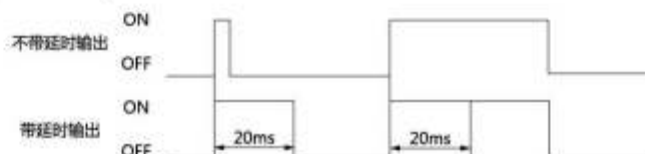
■ 设定 Setting

◆ 检测 (色标 - 背景) Detection (Mark---Background)

- 1、放置色标在传感器光斑的前面,按色标  MARK 按键直到准备灯 (黄色) 熄灭。
 - 传感器会用红、绿、蓝、三色光源交互对色标进行检测。在此过程中请不要移动色标。
 - 2、放置背景色到传感器光斑的前面,按一下背景  BKGD 按键,传感器会用红、绿、蓝三色光源交互对背景色进行检测。在此过程中也请避免背景色的移动。
 - 传感器可以自动选择亮通 / 暗通操作模式,以深颜色做色标 - 浅颜色做背景进行设定时为暗通模式;以浅颜色为色标 - 深颜色为背景进行设定时为亮通模式。
 - 如果以上操作后准备灯 (黄色) 一直保持为亮,则设定成功。
 - 如果准备灯慢慢闪烁,则标明色标和背景没有足够的对比度而设定失败。
 - 如果设定失败,请再按一次色标  或背景  按键,传感器就又回到原先的设定状态。从第一点重新再做设定的操作。
- 1、Set the color code in front of sensor light, Press "MARK" button till YELLOW light off.
 - Sensor will use red green and blue light interaction to test the color code. Please don't move the color code during this period.
 - 2、Set background color in front of sensor light, Press "BKGD" button, sensor will use red green and blue light interaction to test the background color, please avoid the movement of background color during this period..
 - Sensor can choose Liangtong or Antong operation mode automatically, regard dark color as color mode, regard light color as background to set timing as Antong mode. Regard dark color as background, regard light color as color mode to set timing as Liangtong Mode.
 - If Yellow light keeps light after do the above the operation, then setting is succeed.
 - If yellow light twinkles slowly, then setting failed, because that mark code and background don't have enough contrast.

◆ 延时设定功能 Delay Setting Function

- 最短输出延续时间可扩展到 20ms, 可与低速的控制和检测系统连接以检测短脉冲。
- 延时功能是否激活由红色灯的点亮或熄灭来表示。
- The shortest output output can be extended to 20ms, can be connected to the speed control and detection system to detect the short pulse.
- Red light's on or off can judge if the delay function is activated.



◆ 激活延时功能 Activated Delay Function

同时按压 MARK  和 BKGD  按键约 2 秒, 知道延迟 DELAY 指示灯 (红色) 点亮, 此时延时功能激活。
Press "MARK" and "BKGD" at the same time for 2s, till red light is on, then delay function is activated.

◆ 取消延时功能 Dancle Delay Function

同时按压 MARK  和 BKGD  按键约 2 秒, 知道延迟 DELAY 指示灯 (红色) 熄灭, 此时延时功能取消。
Press "MARK" and "BKGD" at the same time for 2s, till red light is off, then delay function is activated.

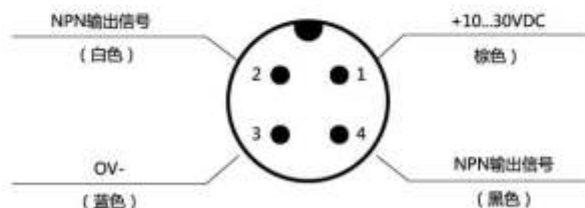
◆ 输出超载 Output Overload

数字量输出超载时, READY 准备灯会以快速闪烁来通知客户。
When digital output is overloaded. Ready light will inform worker by twinkling slowly.



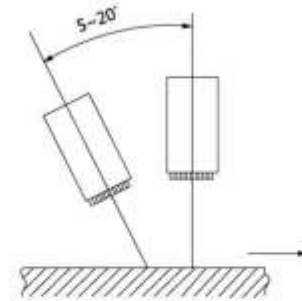
EX- II -3D T6
温度等级: T6 (<85°C); Temperature grade: T6(<85°C)
最大耗电量: 在 30Vdc 时为 1500mW; Max power consumption: 1500mW when is 30Vdc
最大内部电容: 750pF; Max Internal capacitance: 750pF
内部电感: 可忽略不计; Internal inductance: could ignore

■ 连接方式 Connection Mode



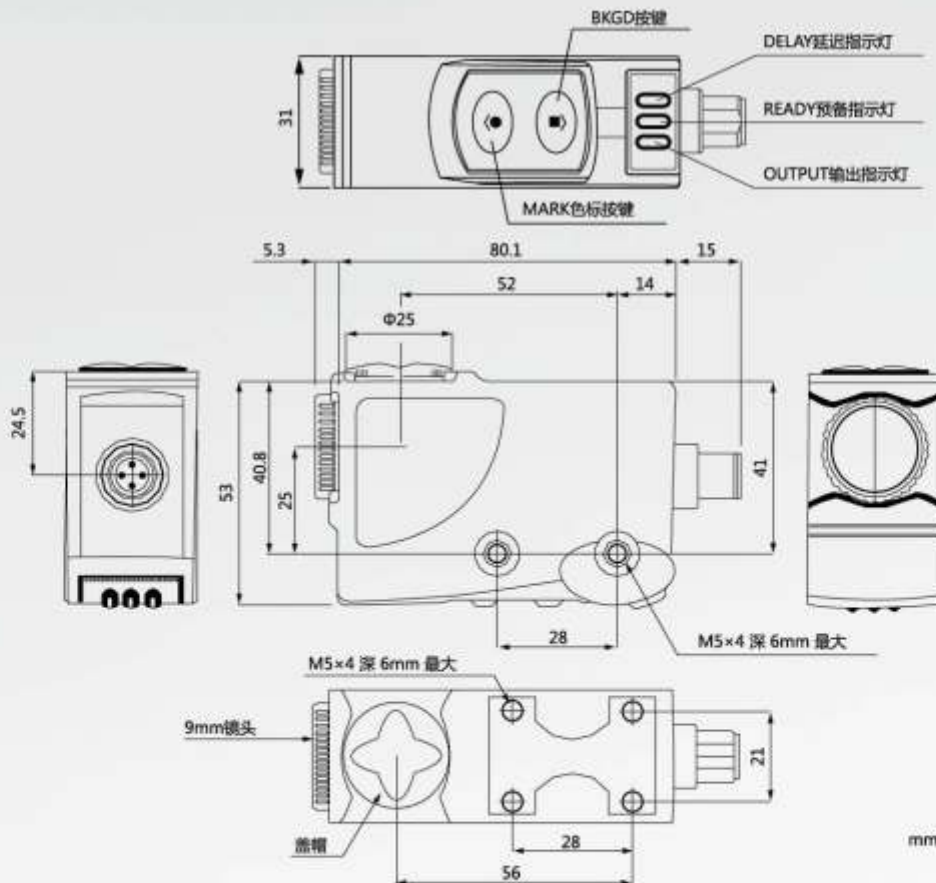
■ 安装 Installation

- 传感器的三个侧面都有 M5×6 的安装孔，在调焦距后锁紧螺丝时请不要使用过大的扭力（2.2Nm 最大）。
- 只须调换镜头的塑胶盖子和镜片，即可选择从正面或侧面进行检测。
- 镜头至检测面的距离请务必与镜片的焦距相同，以达到最高的检测灵敏度。
- 在正常情况下镜头跟检测面应成 90 度角垂直状态。
- 如果是光反射率较强物料的检测，建议把检测角度倾斜 5~20 度，并根据所检测的物料以及物料的移动方向作适当的调整，见右图。



- Three sides of color mark sensor has open holes with M5x6, after adjusting the distance please don't use the torsion more than 2.2Nm when lock the screw.
- We only need to change the lens plastic cap and eyeglass and could choose to test from front and side.
- Distance from lens to inspection face must be the same with eyeglass, to achieve the max detection sensitivity.
- Lens should be in 90 degree vertical plane state with detection face under normal circumstances.
- If it is detection for strong light reflectivity material, suggest inclines the detection angle to 5 to 20 degrees, and do appropriate adjustment according to the testing material and moving direction. See figure below:

■ 外观尺寸 External Dimension



■ 面板控制 Control Panel

- 输出指示灯 (OUT 绿色)

显示输出状态, 有输出时灯亮。

- 准备指示灯 (READY 黄色)

在工作期间, 黄色灯一直保持点亮, 表示处于正常工作状态, 快速闪烁代表输出超负载。

- Output indicator (Green)

Show output status, light is on if have output.

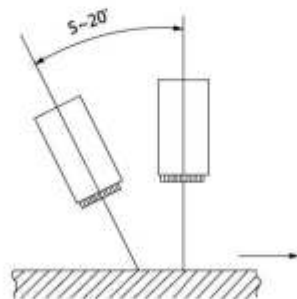
- Ready indicator (Yellow)

Yellow light shows normally on shows it work normally in the cause of work, if stwinkle quickly means ovlerload output.



■ 安装 Installation

- 传感器的三个侧面都有安装孔 (一面是 M5×6, 另两面是 $\phi 4$ 通孔)。
- 有 6 种不同的安装方式。
- 只须调节镜头的塑胶盖子和镜片, 即可选择从正面或侧面进行检测。
- 为了达到最高的检测灵敏度, 镜头至检测面的距离请务必与镜片的焦距相同。
- 在正常情况下镜头跟检测面应保持垂直。
- 如果是光反射率较强物料的 (如塑料或金属片), 建议把检测角度倾斜 5~20 度, 并根据所检测的物料以及物料的移动方向作适当的调整, 见图 1。



- Three sides of color mark sensor has open holes (one side is M5x6, other two sides are $\phi 4$).
- We have 6 different installation type.
- We only need to change the lens plastic cap and eyeglass and could choose to test from front and side.
- Dsistance from lens to inspection face must be the same with eyeglass, to achieve the max detection sensitivity.
- Lens should be in 90 degree vertical plane state with detection face under normal circumstances.
- It is detection for strong light reflectivity material .suggest inclines the detection angle to 5 to 20 degrees, and do appropriate adjustment according to the testing material and moving direction. See figure below:

■ 连接方式 Connection Mode



■ 设定 Setting

◆ 检测 (标记 - 背景) Detection (Mark---Background)

1. 将传感器的镜头与材料的距离调整为 10mm 以达到最高的灵敏度。
 2. 将传感器的光斑对准材料的色标记, 按 MARK 按键直至准备灯 (黄色) 熄灭。
传感器会用红、绿、蓝三色光源交替对色标进行检测。此时请不要移动材料和传感器。
 3. 再将传感器光斑对准材料的背景色, 按一下 BKGD 按键, 传感器会用红、绿、蓝三色光源交替进行检测。在此过程中也请避免移动材料和传感器。
• 传感器可以自动选择亮通 / 暗通操作模式, 按深颜色标记到浅颜色标记顺序进行设定时为暗通模式, 按浅颜色标记到深颜色标记顺序进行设定时为亮模式。
• 如果设定后准备灯 (黄色) 一直保持为亮, 则设定成功。
• 如果准备灯慢慢闪烁, 则表明色标和背景没有足够的对比度而设定失败。如果设定失败, 请从步骤 1 开始重新进行设定。
1. Set the distance to be 10mm between lens and material, to achieve the max detection sensitivity.
 2. Set the color code in front of sensor light, Press "MARK" button till YELLOW light off.
Sensor will use red green and blue light interaction to test the color code. Please don't move the color code during this period.
 3. Set background color in front of sensor light, Press "BKGD" button, sensor will use red green and blue light interaction to test the background color, please avoid the movement of background color during this period..
• Sensor can choose Liangtong or Antong operation mode automatically, regard dark color as color mode, regard light color as background to set timing as Antong mode. Regard dark color as background, regard light color as color mode to set timing as Liangtong Mode.
• If Yellow light keeps light after do the above the operation, then setting is succeed.
• If yellow light twinkles slowly, then setting failed, because that mark code and background don't have enough contrast. So we need to reset from step 1.

◆ PNP/NPN 输出信号设定 PNP/NPN Output Singal Setting

• 数字输出信号可以被设置为 PNP 或 NPN 输出。

改变输出信号时请同时按住 MARK 按键和 BKGD 按键保持 10 秒的时间。

设定完成时会通过准备灯（黄色）显示状态的改变来通知客户。

按住按键 1 秒后，准备灯会熄灭，一直保持按住按键到准备灯亮再松开（10 秒）。

输出设定通过准备灯来通知，放开按键，当准备等闪 1 次表示为 NPN 输出，闪烁 2 次则表示是 PNP 输出。

• Digital output singal can be setted as PNP/NPN

Change the output singal ,please also press "MARK" and" BKGD" button for 10s。 After finishing setting,will inform worker by yellow light.

Press the button for 1s,yellow light will be off, keep pressing till the yellow light is on again,then loose it.

Output setting should be noticed by yellow light.release the button,yellow light twinkle 1 time means NPN output, twinkle 2 times means PNP output.

◆ 输出过载 Output Overload

数字输出信号过载是通过准备灯的快速闪烁来表示的。

Digital output singal overload is prepared by the rapid flashing of light.

■ 技术参数 Parameter

工作电压 Working voltage	10...30Vdc
纹波 Ripple wave	2Vpp 最大 Max:2vpp
耗电量（不包括输出电流） Power consuption(exclude current output)	85mA
输出信号 Output singal	1 路 PNP/NPN 输出可选 30Vdc 最大（短路保护）出厂设定为 NPN 输出 Optional PNP/NPN output max 30vdc(short circuit),factory setting is NPN output
输出电流 Output current	100mA 最大 Max: 100mA
输出饱和电压 Output Saturation voltage	≤ 2V
响应时间 Response time	33 μ s
开关频率 Switch frequency	15KHz
模拟输出信号 Analog singal	0...5.5V（3V ± 10% 在自度 90% 时）
模拟输出阻抗 Analog output resistance	2.2KΩ（带短路保护）2.2k (with short circuit protection)
时间延迟 Time delay	0...20ms 通过延时选择线可选择 0-20ms can be choose by delay choose line
暗通 / 亮通选择 Antong/Liangtong optional	自动 Automatically
指示灯显示 Indicator display	输出 LED（绿色）/ 准备 LED（黄色）Output LED(green),ready LED(yellow)
工作温度 Work temperature	-10...55℃
储存温度 Storage temperature	-20...70℃
电磁保 Electromagnetic protection	双层绝缘回 Double insulation
检测距离 Detection distance	10mm ± 3mm
最小光斑尺寸 Min spot size	1.5 × 5mm
光源类型 Light source type	蓝色（465nm）/ 绿色（520nm）/ 红色（630nm）自动选择 Blue(465nm)Green(520nm)Red(630nm)Auto selection
环境光抑制 Ambient light inhibition	依照 N60947-5-2 According to EN60947-5-2
振动 Shaking	0.5mm 振幅, 10...55Hz, 在每个方向（EN60068-2-6） 0.5mm amplitude, 10...55HZ frequency,all direction(EN60068-2-6)
冲击 Impact	11ms（30G），6 次冲击, 在每个方向（EN60068-2-27） 11ms(30G),6 impact,all direction(EN60068-2-27)
外壳材质 Shell material	ABS
盖子材质 Eyeglass material	ABS
镜头材质 Lens material	PMMA
保护等级 Machancial prduction grade	IP67
连接方式 Connection type	M12-4
重量 Weight	Max 310g

■ 附加功能 Additional Function

◆ 模拟输出信号功能 Analog Output Singal Function

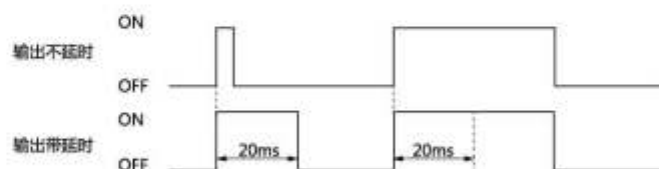
HW46-W 还可以提供一个和传感器接受的信号成正比的 0~5.5V 的电压模拟输出信号。
 输出电压的大小与反射物体的深浅程度相关，在 90% 白度时电压大约为 3V 左右。

HW46-W could provide an analog output singal which is proportional to the sensor recceived singal.
 Size of output voltage has relationship with depth of reflected objects.voltage should be 3v when brightness is 90%.

◆ 延时输出设定功能 Delay Output Setting Function

输出延迟时间可扩展到 20ms，方便与系统的低速接口相连接以检测高速窄脉冲。

Output delay time could be extended to 20ms.,in order to links with system low speed interface to detect the narrow pulse.



◆ 启动延时功能 Start Delay Function

- 连接延时信号线（灰色）到电源电压。
- Connect the delay singal line(grey) to power supply voltage.

◆ 停止延时功能 Stop Delay Function

- 将延时信号线（灰色）连接到 0V 或悬空不接。
- Connect the delay singal line (grey) to 0V, or don't pick up.



EX- II -3D T6

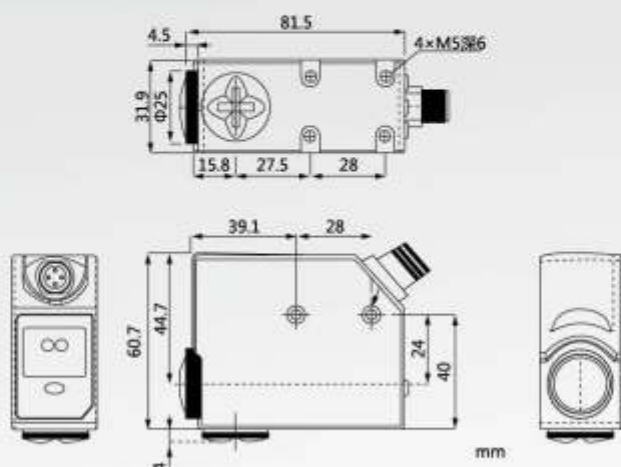
温度等级: T6 (<85℃); Temperature grade: T6(<85℃)

最大耗电量: 在 30Vdc 时为 1500mW; Max power consuption: 1500mW when is 30Vdc

最大内部电容: 450pF; Max Internal capacitance: 450pF

内部电感: 可忽略不计; Internal inductance: could ignore

■ 外观尺寸 Dexternal Dimension



■ BZJ 系列色标传感器 series of color-sensor

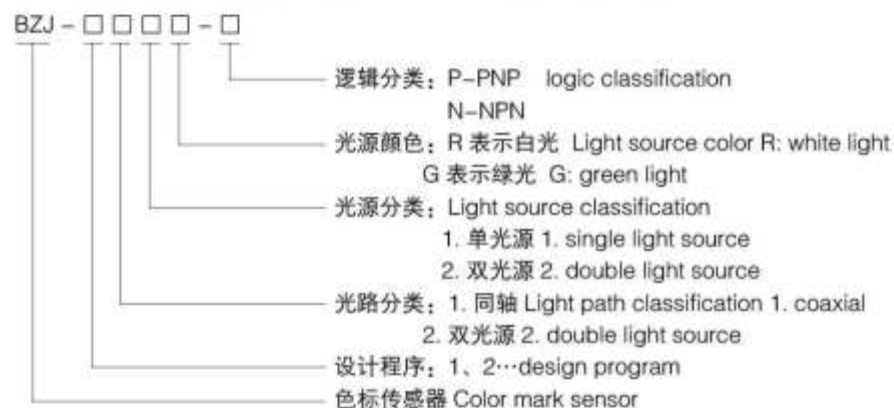
一、主要特点 Main Features

BZJ 系列色标传感器采用光发射接收原理，发射调制光，接收被测物体的反射光，并根据接收信号的强弱来区分不同的颜色或判别物体的存在与否。在包装机械、印刷机械、纺织及造纸机械的自控系统中作为传感器与其它仪表配套使用，对色标，或其它可作为标记的图案色块、线条、或物体的有无进行检测，可实现自动定位、辨色、纠偏、对版、计数等功能。本系列传感器采用光学技术，半导体电子技术、调制解调技术，具有灵敏度高，响应速度快，抗背景光干扰能力强、结构紧凑，使用方便等特点。

I. General introduction

BZJ Series Color Code Sensor applies the light emitting and receiving principle. It will send out modulating light, receive the reflecting lights from detected object, and distinguish the color or recognize the existence of objects according the intensity of the receiving signals. It can serve for sensor in the automatic control systems for packing machinery, printing machinery, texture and paper making machinery, etc and be used with other instruments to detect the existence of the object marked with color code, pattern code, line or others. It has the functions of self-locating, recognizing colors, rectifying deviation, pattern checking and countering. The sensor applies optical technique, semi-conductor electronic technique, and modulation demodulation, and has the features of high sensitivity, quick response speed, strong anti-background interference, compact structure and convenient operation, etc.

二、型号、技术参数 Model and technical parameters



外形编号 Outward appearance code	BZJ-211	BZJ-311	BZJ-411	BZJ-511
外形图例 Outward appearance illustration				
外形尺寸 mm Size(mm)				
供电电压 Supply Voltage				
使用环境温度 Ambient temperature				
检测方式 Detecting method				
检测距离 Sensing distance				
光源色谱 Chromatogram of light				
光点 Facula				
响应时间 Response time				
输出电流 Output current				
输出方式 Output type				
外壳材料 Shell material				
引出线长度 Cable Length				
保护功能 Protection	电源反相保护、负载短路保护 RP-power protection, load short-circuit protection			
重量 Weight				

■ 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，对高反身系数纸面（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
- 光点细小，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 campaign signs detected by photoelectric switch is issued its own light source scan in the paper was seized on the surface. Because of the colour of the surface reflection of different to different amount of light to achieve the color of the identification tags.
- coaxial optical design, the high coefficient of paper-based anti-body (such as aluminum foil, etc.) and adaptable.
- with blue, green, red and other light sources optional, color-resolved all kinds of convenience
- spot small, very high resolution.
- 0.1 ~ 1m/s response to the high speed, can adapt to all kinds of packaging machines, bag and a printing machine that needs control.
- excellent in-circuit design, various anti-electromagnetic, optical interference of miscellaneous good, stable operation, the correct action.
- sensitivity adjustment Knob is no need to regulate the use of tools.



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 Coasial reflection	负载电流 Load current	200mA(max)
检测距离 Detect 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。当负载电流 L>200mA 时开关自动跳开，而在 L ≤ 200mA 时信号又自动恢复。同时具有任意按错线保护。VS voltage of anti-polarity protection, Output is short circuit protection. When electric current load L> 200mA switch automatically jump at open The L ≤ 200 mA when the signal is automatically replies. At the same time, an arbitrary line on the wrong protection.
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 (root Zelkova acuminata models table selection)	灵敏度 Sensitivity	单圈可调 Single cyde adjust
光点 Spot	ø0.5~ø1.5	抗环境光 Anti-environment Light	白炽灯 (Incandescent) <3000LX 太阳光 (Sunlight) 10000LX
检测角度 Detection of perspective	光线与被测特表面垂直 允许仿差 ± 15° Special lighting and measured the vertical surface to allow poor imitation ± 15°	防护等级 protection Level	IP67(防潮防尘 Moisture-proof dust)
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 light darkcan select	外壳材料 Case material	金属 Metal
输出指示 Output instructions	红色 (Red) LED	引出线 Raises thread	ø5.4PVC 四芯护套屏蔽电缆 标准长 2m ø5.4PVC Four core sheath shield 2 m long cable standards
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) 300g

■ Ks 系列标志检测型光电开关 series of color-sensor

一、主要特点 Main Features

- KS 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。
- 具有白、蓝、绿、红等多种光源可选，对分辨各种颜色带来方便。
- 光点细小、分辨率极高。
- 0.1 ~ 1 ms 的高响应速度、能适应各种包装机，制袋机和印刷机械之控制需要。
- 优异的内电路设计、抗各种电磁、杂光干扰性能优良、操作稳定、无误动作。
- 具备灵敏度调节旋钮、不须使用工具即可调节。
- KS series mark test photo sensor in through light by itself to scan in the objected face.because of the color different make the light is different,so that up to the identify of the color mark,
- Coaxial design,is strongly fit for the high reflectance(such as aluminum),
- Have blue green red light can select,and it is convenience to distinguish each color.
- Light poing is exiguous,distinguish capacitane is very hih,
- 0.1~1m/s have high response speed.can fit for every packing machine,bag-made machine and printing machine for control the need.
- Excellent in-circuit design, various anti-electromagnetic, optical interference miscellaneous excellent performance, operation stability, correct action.
- Have the sensitive adjust knob,no use the tool also can 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
C2(C22)	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 Coasial reflection	负载电流 Load current	200mA(max)
检测距离 Detect 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。VS voltage of anti-polarity protection, Output is short circuit protection. When electric current load L> 200mA switch automatically jump at open The L ≤ 200 mA when the signal is automatically replies. At the same time, an arbitrary line on the wrong protection.
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 (root Zelkova acuminata models table selection)	灵敏度 Sensitivity	单圈可调 Single cyde adjust
光点 Spot	ø0.5~ø1.5	抗环境光 Anti-environment Light	白炽灯 (Incandescent)<3000LX 太阳光 (Sunlight)10000LX
检测角度 Detection of perspective	光线与被测特表面垂直 允许仿差 ± 15° Special lighting and measured the verical surface to allow poor imitation ± 15°	防护等级 protection Level	IP67(防潮防尘 Moisture-proof dust)
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 light darkcan select	外壳材料 Case material	工程塑料 Engineering Plastics
输出指示 Output instructions	红色 (Red) LED	引出线 Raises thread	ø5.4PVC 四芯护套屏蔽电缆 标准长 2m ø5.4PVC Four core sheath shield 2 m long cable standards
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)300g

■ E3X-A11 光纤放大器 Fiber optic amplifier

一、主要特点 Main Features

- 用 8 回转调整旋钮即可进行微调整的通用型。
- 是传统产品检测距离的 2 位。
- 带有应差可变旋钮
- 使用脉冲亮灯进行 20 μ S 的超高速应答。
- 以绿色学源可检测微妙的色差。
- 8 rotary knob adjustment can be carried out to adjust the micro-size-fits-all.
- traditional product testing distance of 2.
- be a poor variable knob
- the use of pulsed light to carry out 20 μ S ultra-high-speed response.
- green to learn the source of subtle color difference can be detected.



二、主要参数 The main parameters

项 目 Project	通用型 NPN 输出 General-purpose NPN output	型号 Model: E3X-A11
光源 (发光波长) Light source (light-emitting wavelength)		红色发光二极管 Red light-emitting diode (660nm)
电源电压 Power supply		DC10~30V [含脉动 (P-P)10%] DC10 ~ 30V [with the pulse (P-P) 10%]
消耗电流 Current consumption		35mA 以下 The following 35mA
控制输出 Output Control		负荷电源电压 DC35 以下, 负荷电流 100mA 以下 (留电压 1V 以下) 集电极开路输出形 (NPN/PNP 的输出因形式不同而异) 入光时 ON/ 遮光时 ON 开关转换式 DC35-voltage power load below below 100mA load current (voltage to remain below 1V) open-collector output type (NPN / PNP output varies as a result of the form) to light when the ON / shading ON when the switch-conversion
应答时间 Response time		动作・复位、各 200 μ s 以下 Reset action, the following 200 μ s
灵敏度调整 Sensitivity adjust		8 旋转无终端旋钮 (带有指示器) 8 rotary knob without end (with indicator)
保护电路 Protection circuit		保护电源逆接线, 保护输出短路, 防止相互干扰功能 Protection against the power connection, output short circuit protection to prevent interference function
照明 Lighting		受光面的光照度, 白炽灯: 3000lx 以下, 太阳光 10000lx 以下 Smooth by the light, incandescent; 3000lx below, following the sun 10000lx
周围温度 Ambient temperature		动作时: -25~+55℃, 保存时: 40~70℃ (不能有结冰, 结露现象) When action: -25 ~ +55 °C, save time: 40 ~ 70 °C (there can not be frozen, the phenomenon of condensation)
周围湿度 Surrounding humidity		35~85%RH, 保存: 保存时: 35~95%RH(不能有结露现象) 35 ~ 85% RH, Save: Save time: 35 ~ 95% RH(can not have the phenomenon of condensation)
绝缘电阻 Insulation resistance		20m Ω 以上 (DC500MV 以兆计) 20m Ω above (DC500MV to trillion dollars)
耐电压 Withstand voltage		AC1,000V 50/60Hz 1min
振动 (耐久) Vibration (durable)		10~55Hz 复振幅 1.5mm X、Y、Z 各方向 2h 10 ~ 55Hz complex amplitude 1.5mm X, Y, Z direction of the 2h
冲击 (耐久) The impact of (durable)		500m/s ² X、Y、Z 各方向 3 次 500m/s ² X, Y, Z direction of the 3rd
保护构造 Protection of the structure		IBC 规格 IP50 (安装保护盖时) IBC standard IP50 (when the installation of protective cover)
连接方式 Connection		导线引出开型 (标准线长 2m) Open-wire leads (standard long line 2m)
重量 (以包装情况下) Weight (in packing cases)		100g
材料 Materials	外壳 Shell	耐热 ABS Heat-resistant ABS
	保护罩 The protective shield	聚酯 Polyester
附属品 Accessories		金属安装配件, 调整用螺丝刀, 操作说明书 The installation of metal accessories used to adjust screwdriver, operation manuals

■ GX4 系列光纤放大器 GX4 Series Fiber Optic Amplifier

一、特点 Features

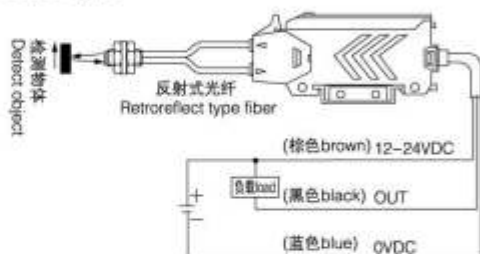
- 适合检测微小物体和微小色差。
- 适应狭小空间和不良环境安装。
- 光纤头能在干扰大、湿度大、温差大需防爆的场合中可靠使用。
- 放大器内藏，动作复位时间均在 1ms 以下。
- 具有短路保护及电源极性保护。
- 亮动、暗动输出状态可通过拨码开关进行选择。
- 具备抗相互干扰功能，可以 2 套紧贴安装。
- 须与光纤配合使用。
- Used in detect the mini object and mini
- Used in the narrow space and color different install in the badness enviroment
- Can used in the strong disturb, big humidity, big different in temperature occasion
- Amplifier inside, action replacement time is below 1ms
- Has short-circuit protection and power polarity protection
- Output state of light-on dark-on can select by switch
- Has disturb resist function, can install together
- Should used together with the fiber



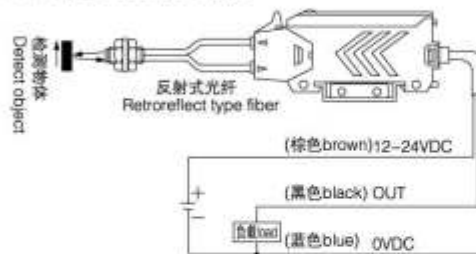
检测方式 Detect form		光纤式 Fiber type		
型号 Model	NPN	GX4-A3R	GX4-A3G	GX4-A3B
	PNP	GX4-A3R-P	GX4-A3G-P	GX4-A3B-P
光源色 Light source color		红色 Red	绿色 Green	蓝色 Blue
电源电压 Power voltage		DC12~24V ± 10% 脉动 (P-P)10% 以下 DC12~24V ± 10% pulsant (P-P) below10%		
消耗电流 Consume current		30mA 以下 Below 30mA		
响应时间 Response time		动作、复位时间均在 1ms 以下 Action、replace time all below 1ms		
输出 Output	NPN	NPN 集电极开路输出：灌入电压 100mA，残余电压 1.1V NPN output: input voltage 100mA, remain voltage 1.1V		
	PNP	PNP 集电极开路输出：拉出电压 100mA，残余电压 1.1V PNP output: output voltage 100mA, remain voltage 1.1V		
指示灯 Indicate light		电源指示灯绿色，动作指示灯红色 Power light is green, working light is red		
输出状态 Output state		亮动、暗动通过拨动开关选择 Light-on、Dark-on is select by switch		
灵敏度调节 Sensitivity adjust		带粗调、细调电位器 With thick tune, thin-tune potentiometers		
连接方式 Connect type		护套多股线引出，长 2m，可接长 Many wires,2m, can add the meter		
壳体材料 Shell material		ABS 工程塑料 ABS plastic		
耐环境光 Working enviroment light		白炽灯：受光面照度 3000Lx，太阳光：受光面照 10000Lx Incandescent lamp:3000Lx,Sunlight: 10000Lx		
环境温度 Enviroment temperature	传感器 Sensor	工作时：-10~+50℃（但不结冰），保存时：-20~+70℃ Working:-10~+50℃ (not ice over),Storing:-20~+70℃		
	光纤 Fiber	工作时：-40~+75℃（但不结冰），保存时：-40~+85℃ Working:-40~+75℃ (not ice over),Storing:-40~+85℃		
环境湿度 Enviroment humidity	传感器 Sensor	工作时：35~85%RH，保存时：35~85%RH Working:35~85%RH, Storing:35~85%RH		
	光纤 Fiber	工作时：35~85%RH，保存时：35~95%RH Working:35~85%RH, Storing:35~95%RH		
允许弯曲半径 Allow bend radii		25mm 以上 Above 25mm		
振动 Oscillate		振频：10~55Hz，振幅：1.5mm，X、Y、Z 方向各 2 小时 Frequency:10~55Hz, Swing:1.5mm, X、Y、Z each 2 hours		
冲击 Inrush		加速度：500m/s ² 约 50g，X、Y、Z 方向各 2 小时 Acceleration:500m/s ² about 50g,X、Y、Z each 2 hours		
绝缘电阻 Insulation resistance		DC500V，200MΩ 以上 DC500V, Above 200MΩ		
绝缘强度 Insulation intension		AC500V,50/60Hz,1 分钟 (0~40℃,85%RH)		
材料 Material		ABS 工程塑料 ABS engineering plastics		
防护等级 Protection grade		IEC IP50		

二、接线图 Wiring diagram

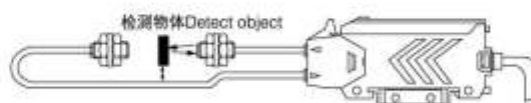
● NPN 输出型 Output Type



● PNP 输出型 Output Type

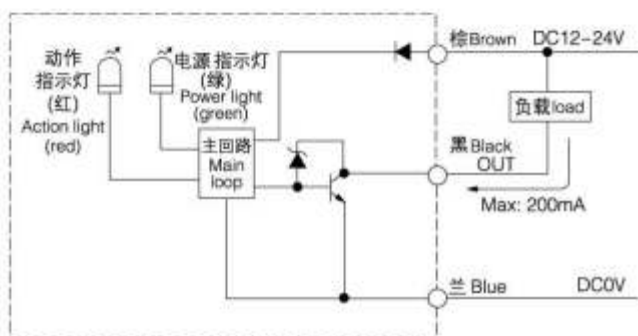


● 对射式光纤应用图 Through beam type



五、控制输出图 Control Output diagram

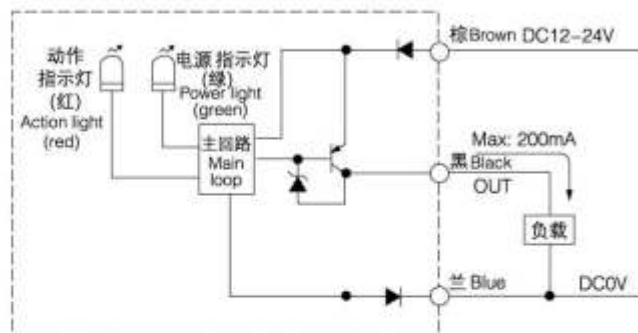
◆ NPN 集电极开路输出型 NPN open-collector output type



◆ 亮动波形图 Light-on Waveform Figure



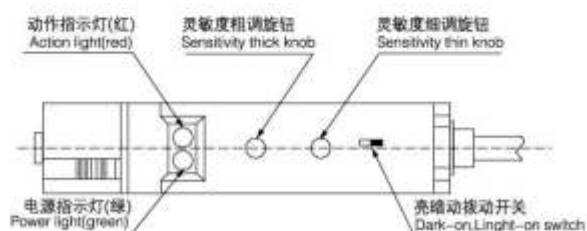
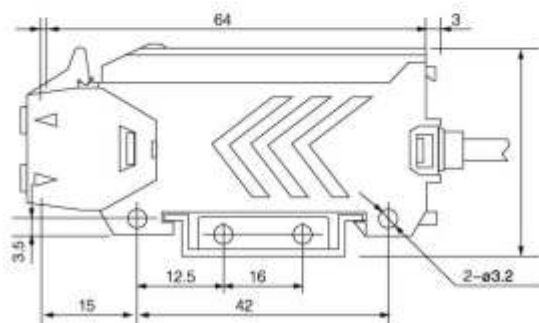
◆ PNP 集电极开路输出型 PNP open-collector output type



◆ 亮动波形图 Dark-on Waveform Figure



六、型号及性能 Model and Performance



三、正确使用方法 Correct Use

- ◆ 光轴调整和灵敏度调整 Coaxial Adjust And Sensitivity Adjust
- ◆ 对射式 Trough Beam Type

灵敏度电位器粗调和细调旋钮均至最大后，将发、受光器相对而置，上下左右缓慢移动，使光轴重合，在动作指示灯（红）点亮的区域中央固定，若检测物体无法遮断光路，可降低灵敏度。

Adjust the potentiometer to the max, put the send and receiver, slowly move to the coaxial superposition, the fix it in then center of the action indicate light(red) if the object can not cover the light,it can be reduce sensitivity

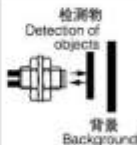
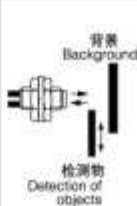
- ◆ 反射式 Reflective

- 检测物体有无

将细调旋钮调至最大，请按下述三个步骤调整灵敏度的粗调电位器

- Detection of objects have or not

Adjust the thin knob to the max then following the three steps to adjust the sensitivity

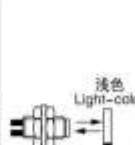
1: 把检测物体放在需要检测的位置上，将粗调旋钮至最小，然后慢慢地往上调，使红灯刚亮，这一点设为A点。 1.Put the detect object, use the thick knob adjust to the least than slowly adjust to the red light on set this point A		
2: 移去检测物，将灵敏度调节旋钮至最大，如此时背景物使红灯亮，应慢慢将灵敏度往下调至红灯刚熄，这一点设为B点。如背景物未使红灯亮时则调节旋钮至最大即为B点。 2.Move the object, Adjust the sensitive to the max, if the background made the red light on, slowly adjust the red light off set this point B, if the background not make the red light on so the max of the knob is settled B		
3: 将灵敏度调节旋钮设定在A点与B点中间，有物体时红灯亮，无物体时红灯熄。否则，应采取拉大传感器与背景物间距或缩短与检测物间距或使背景物粗糙灰暗等方法，重新调整。 3. Setting the knob in the center of A and B then have the object the red light on, otherwise, should adopt enlarge the distance of sensor and background or shortage the detect distance		

- 检测色差

先将细调旋钮调至中间，请按下述四个步骤调整灵敏度

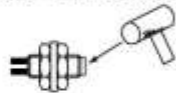
- Detection of chromatic aberration

Adjust the thin knob to the Intermediate then following the four step to adjust the sensitivity

1: 把检测物体上浅色部分放在需要检测的位置上，将粗调旋钮至最小，然后慢慢地往上调，使红灯刚亮。 1.Put the light park in the detect place, adjust the thick knob to the least, then adjust above slowly, make the red light on		
2: 将细调旋钮慢慢往下调至红灯刚好熄后再慢慢往上调至红灯刚亮，这一点设为A点 2.Adjust the thin knob to the red light stop, then slowly adjust to the red light on set this A		
3: 将检测物上深色部分移至需要检测的位置上，将细调旋钮慢慢往上调至红灯刚亮后再慢慢往上调至灯红刚熄，这一点设为B点。 3.Put the dark part move to the detect place, adjust the thin knob to the red light on, then slowly adjust to the red light off, this setting B.		
4: 将灵敏度细调旋钮设定在A点与B点中间，检测到浅色部分时红灯亮；检测到深色部分时红灯熄。 4.Setting the knob in the center of A and B when detect the light part, the red light on, when detect the dark part the red light off		

四、注意事项 Notice

- ◆ 设定距离小于检测距离的 3/4。
- ◆ 避免腐蚀性气体、灰尘较多振动严重加水、油、药剂直接溅散的场所。
- ◆ 保护传感头
- ◆ 不能用物体敲打光纤传感头，避免损坏。



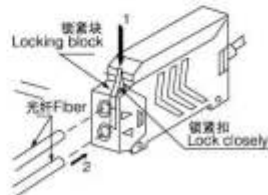
- ◆ Setting distance should less than 3/4 of the detecting distance
- ◆ Avoid the causticity, more dirty and water, oil, medical occasion and strong sunlight occasion.
- ◆ Protect the sensor head
- ◆ Do not knock the products, avoid the destroy, If the surface of fiber is dirty, please use paper scrube.

- ◆ 光纤插入

1 插入锁紧块，2 把光纤头插入放大器的光纤插孔，直至完全插入时停止，再板上锁紧块将光纤锁紧。

- ◆ Pull the lock place

Insert the head of the fiber to the hole of the amplifier, till insert completly then stop, and push the lock to lock the fiber



- ◆ 安装光纤传感头

光纤检测头

- ◆ Install the sensor head of fiber

Fiber detect



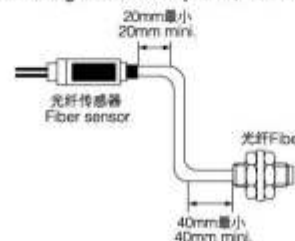
螺钉直径 Screw diameter	最大紧固力矩 Maximum torque fastening
M3	8kgf/cm
M4	
M5	10kgf/cm
M6	12kgf/cm

- ◆ 光纤连接

用力小于 0.3kg，避免光纤受拉或受压，光纤弯曲半径应大于 25mm。

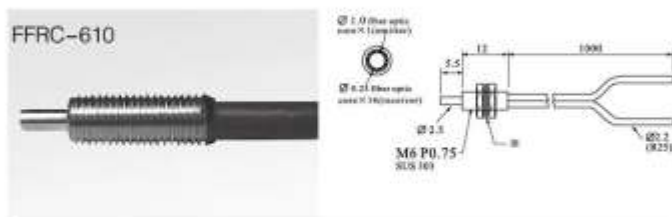
- ◆ Fiber connector

Torque less than 0.3lg avoid fiber press, fiber bend radii should more than 25mm



■ 对照式光纤 Contrast Type Optical Fiber

FFRC-610



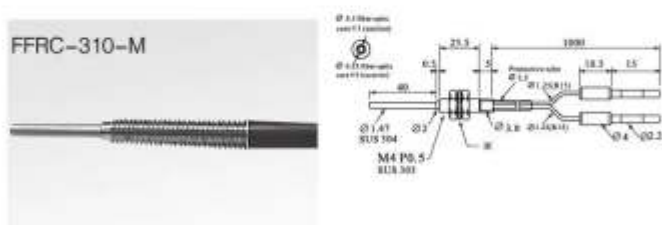
FFRC-310



FFRC-610-I



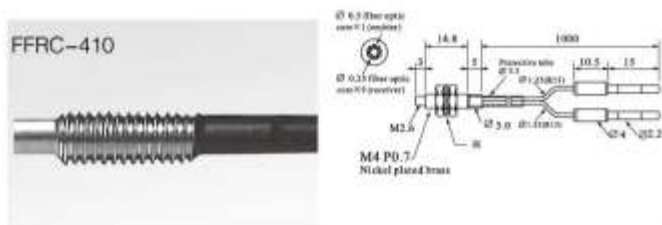
FFRC-310-M



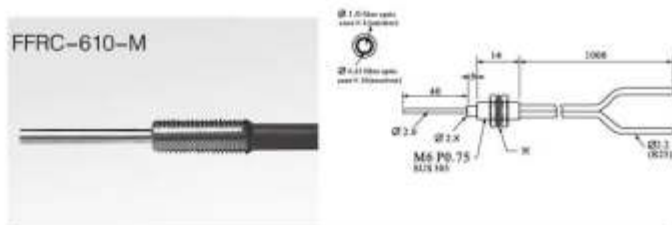
FFRC-610-S



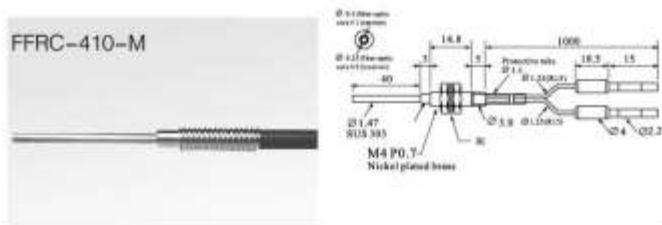
FFRC-410



FFRC-610-M



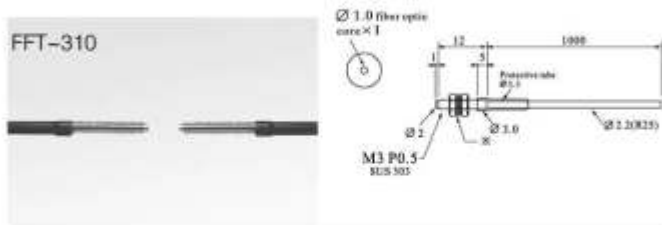
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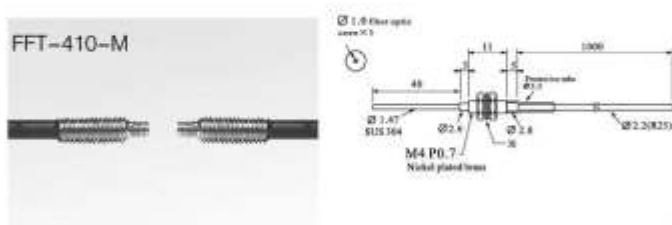
FFRC-210-Q



FFT-310



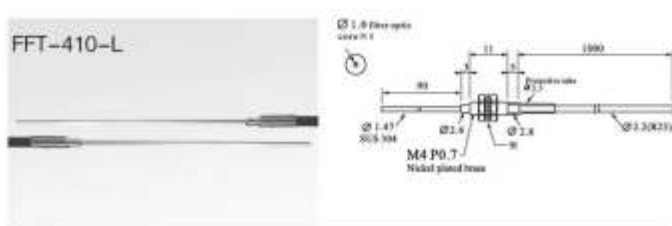
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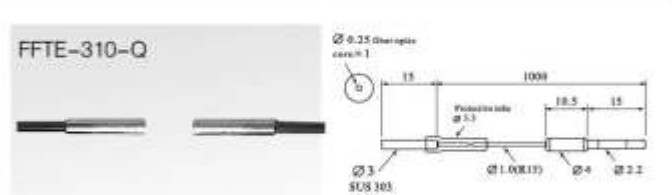
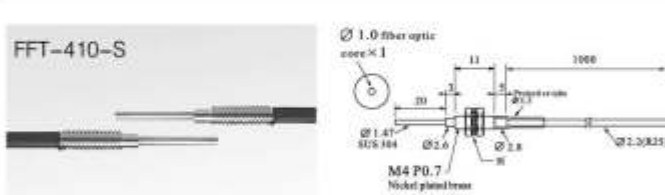
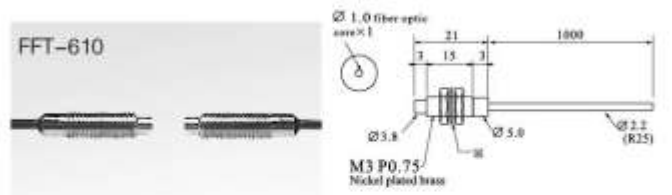
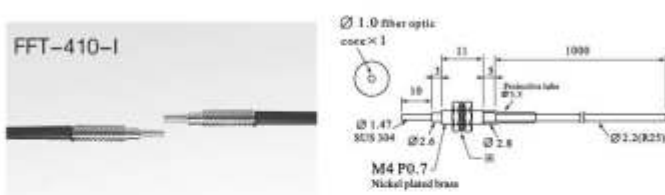
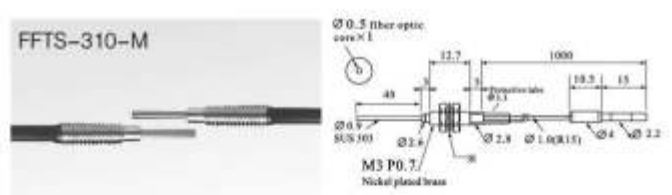
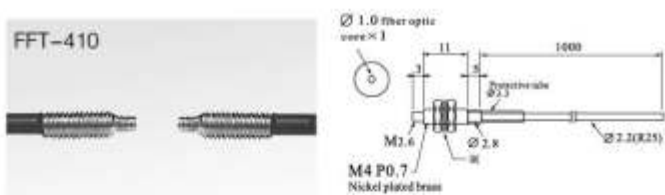
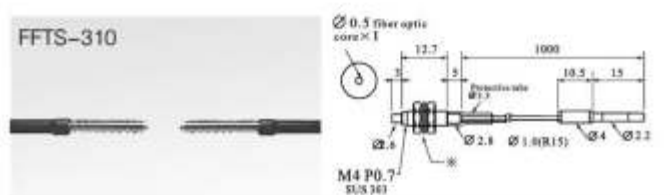
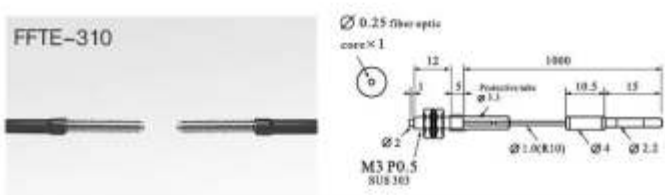
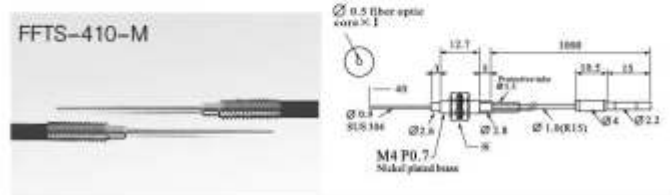
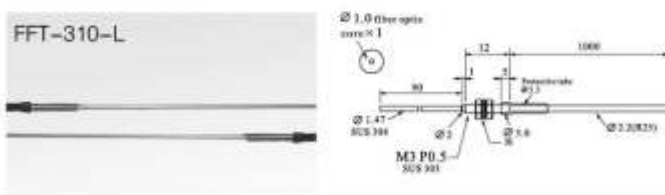
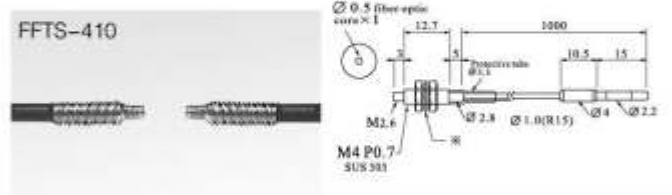
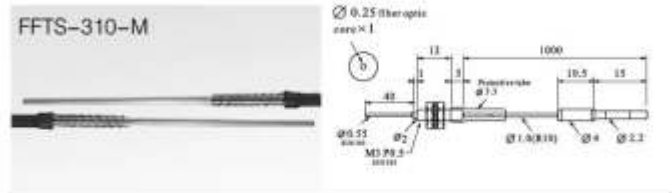


FFT-310-I

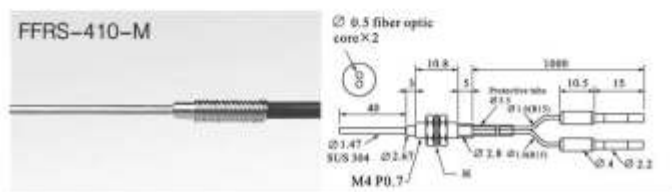
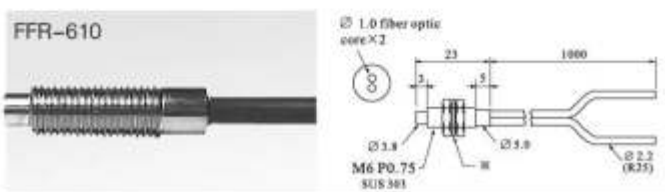


FFT-410-L

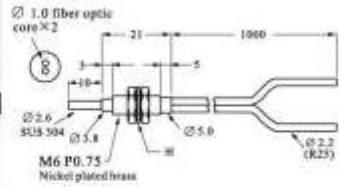




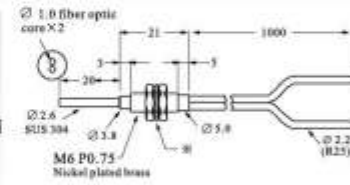
■ 漫反射式光纤 Diffuse Reflection Optical Fiber



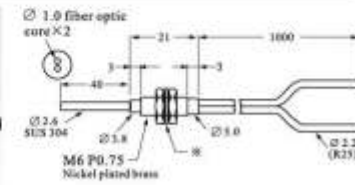
FFR-610-I



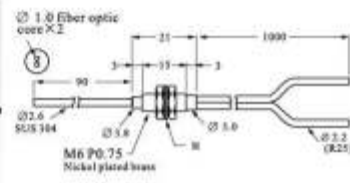
FFR-610-S



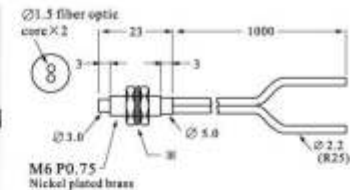
FFR-610-M



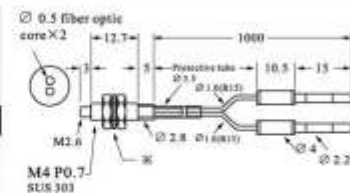
FFR-610-L



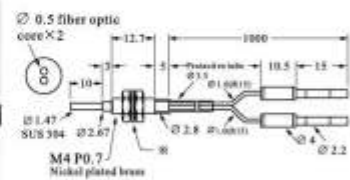
FFRX-610



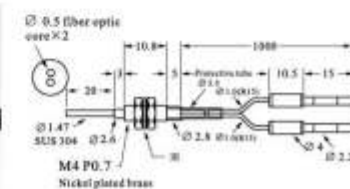
FFRS-410



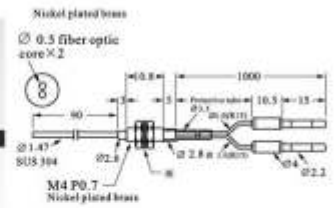
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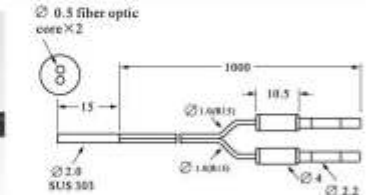
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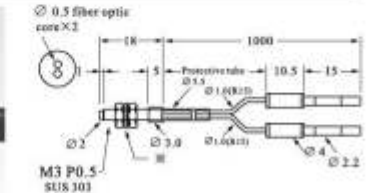
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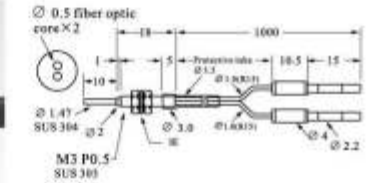
FFRS-210



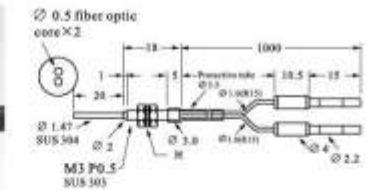
FFRS-310



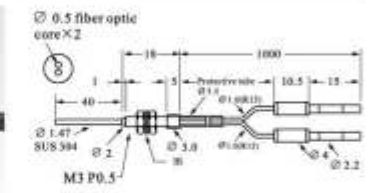
FFRS-310-I



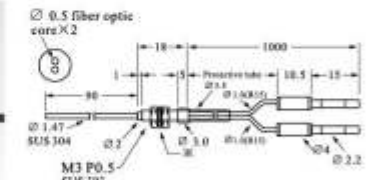
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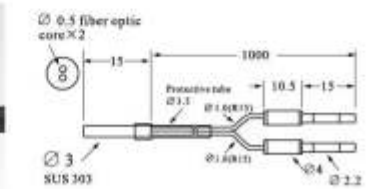
FFRS-310-M



FFRS-310-L



FFRS-310-Q

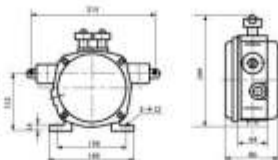


拉绳开关跑偏开关

Pull Switch Bias Switch

■ KLT2(HFKLT2) 系列双向拉绳开关

KLT2(HFKLT2) Series Two-way Pullswitch

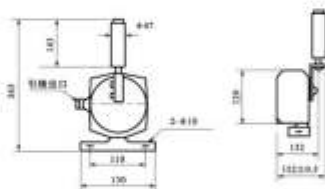


双向拉绳开关是用于胶带输送机现场紧急事故停机的一种保护装置。当紧急事故发生时，在现场任意处启动拉绳开关，均可发出停机信号。

The dual-direction stretching wire switch is a protection device to stop adhesive tape transportation machine in case of emergency. When the emergency appears, starting the stretching wire switch at any position of accident spot can send out the stop signal.

■ KPT1(HFKPT1) 系列两级跑偏开关

KPT1(HFKPT1) series double-pole bias switch

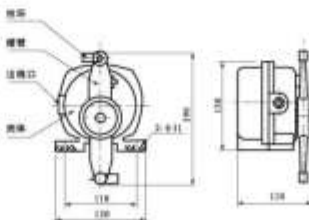


跑偏开关用于检测胶带机胶带的跑偏量和扭出程度。可防止皮带边缘的损伤和因为胶带的跑偏而引起的物料跌落。是实现自动报警和停机的一种保护性开关。

The deviation correction switch is to check the deviation extent of adhesive tape of the adhesive tape machine to prevent the material loss caused by damage of belt marginal and deviation of adhesive tape. It is a protective switch to realize automatic alarm and stop.

■ DCX-K-1 型电子式拉绳开关

Electronic pullswitch controller



拉绳开关是用于紧急事故停机的一种保护装置。当紧急事故发生时，在现场任意处启动拉绳开关，均可发出停机信号。

The dual-direction stretching wire switch is a protection device to stop machine in case of emergency. When the emergency appears, starting the stretching wire switch at any position of accident spot can send out the stop signal.

永磁感应器

Permanent Magnetic Transducer

■ 概述 Brief introduction

永磁感应器又称电梯感应开关，用于电梯平层限位控制，也可用其他限位控制。产品接点用防酸、防潮结构的真空继电器，在磁场的作用下动作，不需要电源工作。接点控制阻性 1A，能控制直流和交流 380V 以下的电源电压。感应器机械寿命 ≤ 12 万次。

Also called lift inductive switch, the permanent magnet sensor is used in the interlayer position limit control of lifts as well as other controls. The joints of this product apply the vacuum relay with acid proof and moisture guard structure. It acts under the effect of magnetic field with no need of power. The control current resistance of joints is 1A, which can control power voltage of less than AC & DC 380V. The mechanical service time of the sensor is equal or less than 120 thousand times.

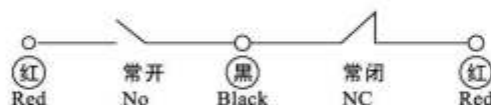
■ 永磁感应器的优点

Advantages of permanent magnet inductor

- ① 体积小 Small bulk
- ② 控制大 Extensive control
- ③ 使用简单 Easy operation

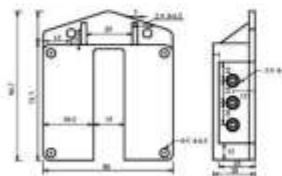
■ 输出接线圈

Output wiring diagram



■ 外形图例及尺寸

Exterior diagram and dimensions



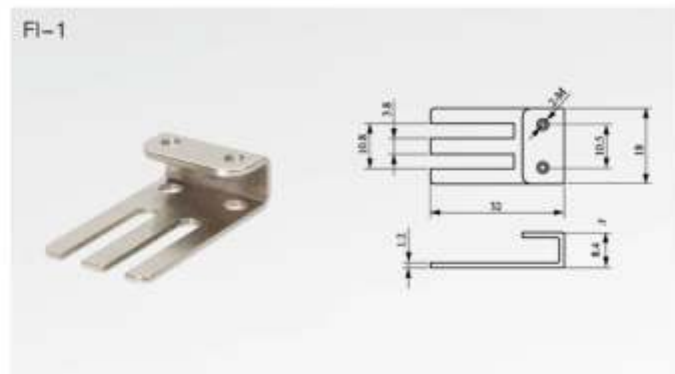
速度传感器

SPEED SENSOR

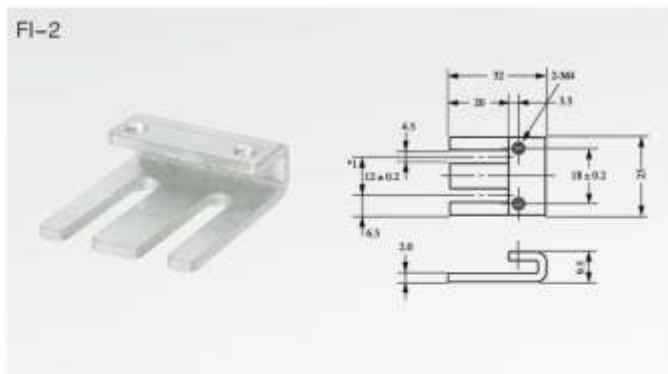


工作电压 Work voltage: 220/240VAC
低频率: 120 a 3000 脉冲 / 分
Low frequency: 120 a 3000 impulse/minute.
高频率: 6000 a 12000 脉冲 / 分
high frequency: 6000 a 12000 impulse/minute.
型号 Type: VA30-10P122
尺寸 size: M30 x 1 x 88
应用 Application: 速度检测 speed detecting

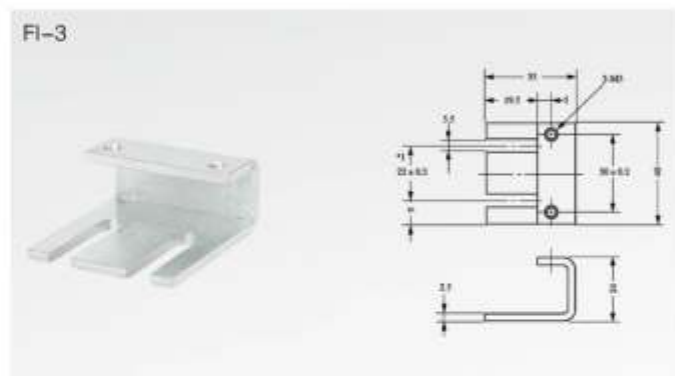
■ 接近传感器支架



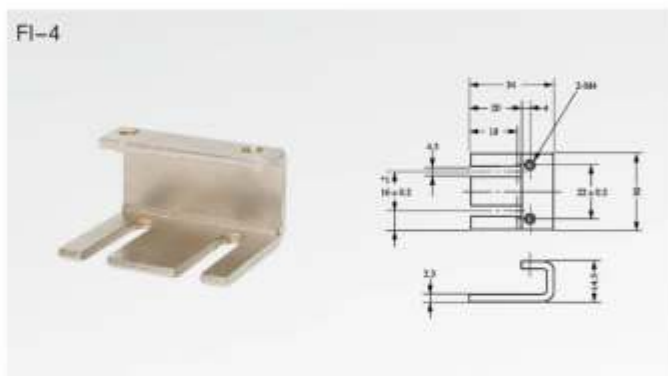
适合传感器型号: IQ1-□□ IQ2-□□ IQ11-□□



适合传感器型号: IQ6- □□

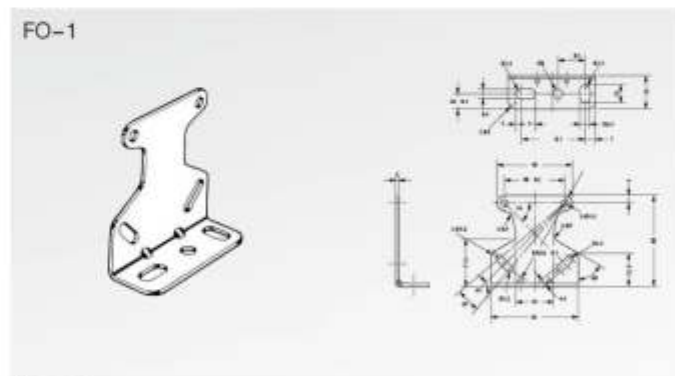


适合传感器型号: IQ7-□□

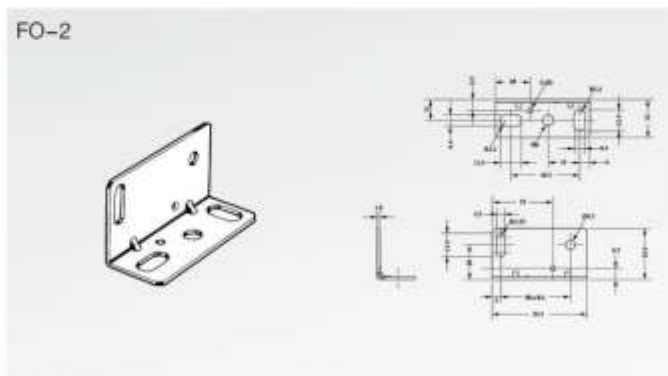


适合传感器型号: IQ10- □□

■ 光电传感器支架



材质：铁



材质：铁



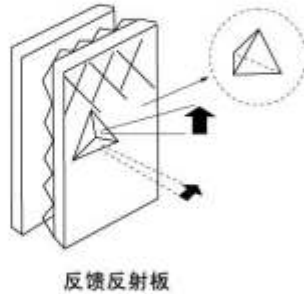
材质：铁

■ TD 镜面反射板及其工作原理 TD Mirror Reflector Plate And Working Principle

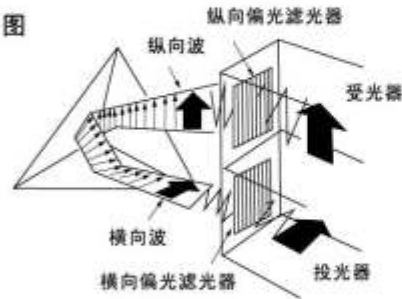
反馈反射光电开关是利用内装的偏光滤器和反馈反射型特点，只接收来自回归发射板的光束功能。

Taking advantage of the built-in polarization filter and the characteristic of feedback reflection type, feedback reflection type photoelectric switch has the function of only receiving the beam returned from the reflector plate.

镜面抑制 (M.S.R) 功能



说明图



■ TD 镜面反射板 TD Mirror Reflector Plate





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