

BOE 京东方



光电传感器GD系列
Photoelectric sensor GD series

用户手册
USER'S MANUAL

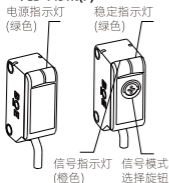
版本: A

1. 安全预防措施 注意

- 避免将传感器线缆与高压动力线从同一管道内穿过，也不要将其绑扎在一起，这将会引起干扰或永久损坏，配线时，请使动力线和传感器线缆相隔30厘米（11.8英寸）以上。
- 在调节灵敏度和信号模式旋钮时，应做好静电防护措施，确保传感器接地良好。
- 不要在环境照明灯和外部灯直接照射到光接收面的场所使用。
- 避免使用纹波系数超出规格的电源（最大10%）。
- 在旋转操作模式选择开关（Light-on, Dark-on）和灵敏度微调器时避免过度用力。
- 本产品仅供目标物检测之用，请勿将本产品用于保护人体或人体部位等目的。

2. 部件名称

(1) GD-T401N(P) /GD-T451N(P)



发射端

接收端

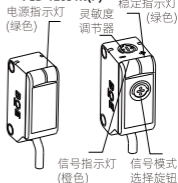
(2) GD-B11N(P)/GD-B31N(P) /GD-H41N(P)/GD-H21N(P) /GD-F31N(P)/GD-F101N(P)



信号指示灯 (橙色)

信号模式选择旋钮

(3) GD-T201N(P) /GD-T2051N(P)

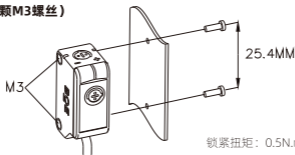


发射端

接收端

3. 安装方法

侧面安装（准备2颗M3螺丝）

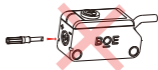


紧固扭矩：0.5N.m或更少

4. 灵敏度调节方法



旋转灵敏度调节器和信号模式旋钮时，请勿用力过度，以避免损坏。



(1) 信号模式选择旋钮

信号模式选择旋钮用于Light- On模式/Dark- On模式的切换



(2) 反射型

假设为Light-On模式时

顺序	调整方法	灵敏度调节器
①	将目标放置在指定位置。缓缓将灵敏度微调器从“-”位置向“+”位置旋转，直到(橙色)输出指示灯亮起(位置“A”)。如果输出指示灯即使在“-”位置也不熄灭，“-”位置即被考虑为位置“A”。	
②	移开目标物。将灵敏度微调器从“-”位置向“+”位置旋转，直到(橙色)输出指示灯亮起(位置“B”)。如果输出指示灯即使在“+”位置也不点亮，“+”位置即被考虑为位置“B”。	
③	将灵敏度微调器调到“A”和“B”之间的中点。验证在指定位置具有或不具有目标物时，(绿色)稳定操作指示灯都点亮。	

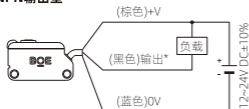
(3) 对射型/回归反射型

假设为Dark-On模式时

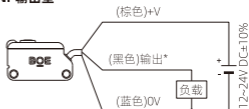
顺序	调整方法
①	将感测头安装在指定位置，移开目标物，(橙色)输出指示灯关闭。
②	将目标放置在指定位置。验证(橙色)输出指示灯亮起。

5. I/O 电路接线图

NPN输出型



PNP输出型



* 对射型传感器的发射端没有输出线

6. 规格

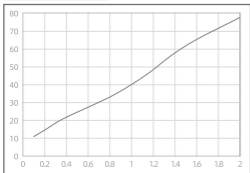
类型		对射型				背景抑制型		回归反射型		漫反射型	
输出方式	NPN线缆输出	GD-T401N	GD-T201N	GD-T451N	GD-T2051N	GD-B11N	GD-B31N	GD-H41N	GD-H21N	GD-F31N	GD-F101N
	PNP线缆输出	GD-T401P	GD-T201P	GD-T451P	GD-T2051P	GD-B11P	GD-B31P	GD-H41P	GD-H21P	GD-F31P	GD-F101P
检测距离*		4m	2m	4m	20m	100mm	300mm	4m	2m	300mm	1000mm
光源		红色LED	红色LED	红外LED	红外LED	红色LED	红色LED	红色LED	红色LED	红色LED	红外LED
灵敏度调整		-	电位器微调(120°)	-	电位器微调(120°)	电位器调整(360°)		电位器微调(120°)		电位器微调(120°)	
响应时间		600μs				1ms					
信号模式		LIGHT-ON/DARK-ON, 微调可选									
指示灯(LED)		发射器: 电源(绿色)				输出(橙色), 稳定操作(绿色)					
		接收器: 输出(橙色), 稳定操作(绿色)									
控制输出		集电极开路,最大电流 100mA(最大30V),剩余电压最大1V									
保护电路		反极性保护, 过电流保护									
额定值	电压	12至24V DC,纹波系数(P-P):最大±10%									
	消耗电流	发射器: 最大20mA				最大25mA					
		接收器: 最大15mA									
耐环境	防护等级	IP67									
	环境光度	白炽灯 最大5000(lx),日光 最大10,000(lx)									
	环境温度	-20°C至+55°C(无冻结)									
	相对湿度	35至85%RH(无凝结)									
	抗振性	10至55Hz, 双振幅1.5mm:X,Y和Z轴每个方向2个小时									
	抗冲击性	1000m/s ² ,X,Y和Z轴每个方向6次									
材料	壳体	外壳: 聚甲醛(POM), 聚碳酸酯(PC)+丙烯腈/丁二烯/苯乙烯共聚物(ABS)。线缆: 聚氯乙烯(PVC)									
	镜头盖	聚甲基丙烯酸甲酯(PMMA)									
重量		约63g(对射型发射器约52g)									

*以最大灵敏度来测量距离

7. 传感器特性图 (以GD-T401为例)

(1) 光点直径图

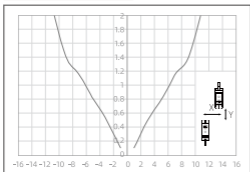
光点直径(mm)



距离(m)

(3) 光轴平行移动性

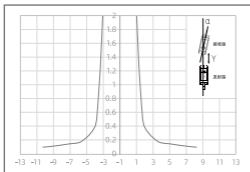
距离Y(m)



距离X(mm)

(5) 接收端偏角检测距离

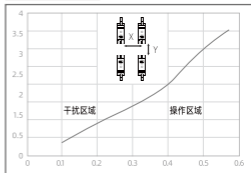
检测距离Y(m)



操作角度 $\alpha(^{\circ})$

(2) 干扰区域

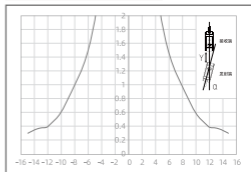
距离Y(m)



距离X(m)

(4) 发射端偏角检测距离

监测距离Y(m)



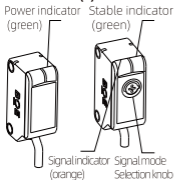
操作角度 $\alpha(^{\circ})$

1. Safety precautions be careful

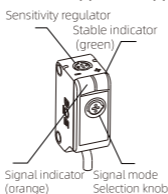
- Avoid passing the sensor cable and high-voltage power line through the same pipe, and do not bind them together. This will lead to Disturbance or permanent damage. When wiring, keep the power line and sensor cable at least 30 cm (11.8 inches) apart.
- When adjusting sensitivity and signal mode knob, electrostatic protection measures shall be taken to ensure that the sensor is well grounded.
- Do not use it in the place where the ambient light and external light directly shine on the light receiving surface.
- Avoid using power supply with ripple coefficient exceeding the specification (maximum 10%).
- Avoid excessive force when rotating the operation mode selector switch (Light on, Dark on) and sensitivity spinner.
- This product is only used for target detection, Do not use this product for the purpose of protecting human body or human parts.

2. Part name

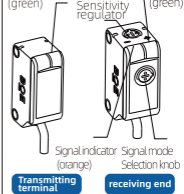
(1) GD-T401N(P) /GD-T451N(P)



(2) GD-B11N(P)/GD-B31N(P) /GD-H41N(P)/GD-H21N(P) /GD-F31N(P)/GD-F101N(P)

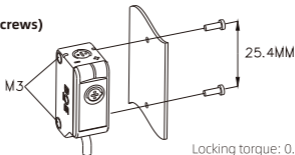


(3) GD-T201N(P) /GD-T2051N(P)



3. Installation method

Side mounting (prepare 2 M3 screws)



Locking torque: 0.5N. m or less

4. Sensitivity adjustment method

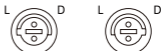


Rotary sensitivity regulator and signal Do not use excessive force when turning the mode knob To avoid damage.



(1) Signal mode selection knob

The signal mode selection knob is used for Light On Mode/Mark Onmode switching



Light- On mode Dark- On mode

(2) Reflex type

Assume light on mode

order	Adjustment method	Sensitivity regulator
①	Place the target at the specified location. Slowly move the sensitivity spinner from the "-" position to the "+" position Rotate until the (orange) output indicator lights up (position "A") if the output indicator is The "-" position does not turn off, and the "-" position is considered as the position "A".	
②	Remove the target. Rotate the sensitivity spinner from the "-" position to the "+" position until the (orange) input The output indicator lights up (position "B"). If the output indicator is not lit even at the "+" position, "+" The position is considered as position "B".	
③	Adjust the sensitivity spinner to the midpoint between 'A' and 'B'. Verify that the specified location has or does not have When there is a target, the (green) steady operation indicator lights up.	

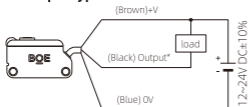
(3) Antithetic type

Assuming Dark-On mode

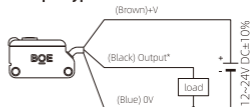
order	Adjustment method
①	Remove the target. Install the sensor head in the specified position, and the (orange) output indicator is off.
②	Place the target at the specified location. The verify (orange) output indicator illuminates.

5. I/O circuit wiring diagram

NPN output type



PNP output type



*There is no output line at the transmitting end of the opposite type sensor

6. Specifications

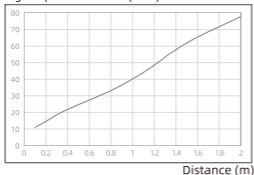
type		Anththetic type				Background suppression type		Retroreflective type		Diffuse reflective type	
Output mode	NPN cable output	GD-T401N	GD-T201N	GD-T451N	GD-T2051N	GD-B11N	GD-B31N	GD-H41N	GD-H21N	GD-F31N	GD-F101N
	PNP cable output	GD-T401P	GD-T201P	GD-T451P	GD-T2051P	GD-B11P	GD-B31P	GD-H41P	GD-H21P	GD-F31P	GD-F101P
Detection distance*		4m	2m	4m	20m	100mm	300mm	4m	2m	300mm	1000mm
Light source		Red LED	Red LED	Infrared LED	Infrared LED	Red LED	Red LED	Red LED	Red LED	Red LED	Infrared LED
Sensitivity adjustment		-	Potentiometer trim (120°)	-	Potentiometer trim (120°)	Potentiometer adjustment (360°)		Potentiometer trim (120°)		Potentiometer trim (120°)	
Response time		600μs				1ms					
Signal mode		LIGHT-ON/DARK-ON, Fine tuning optional									
Indicator light (LED)		Transmitter: power (green)				Output (orange), steady operation (green)					
		Receiver: output (orange), steady operation (green)									
Control output		Open collector, maximum current 100mA (maximum 30V), maximum residual voltage 1V									
Protection circuit		Reverse polarity protection									
Rating	Voltage	12 to 24V DC, ripple coefficient (P-P): maximum ± 10%									
	Current consumption	Emitter: 20mA maximum				25mA maximum					
		Receiver: 15mA maximum									
Environmental resistance	Degree of protection	IP67									
	Ambient luminosity	Incandescent lamp max. 5000 (lx), daylight max. 10000 (lx)									
	ambient temperature	-20 °C to +55 °C (no freezing)									
	relative humidity	35 to 85% RH (non condensing)									
	Vibration resistance	10 to 55Hz, double amplitude 1.5mm: 2 hours in each direction of X, Y and Z axes									
	Impact resistance	1000m/s ² , 6 times in each direction of X, Y and Z axes									
Material Science	housing	Shell: polyformaldehyde (POM), polycarbonate (PC) + acrylonitrile/butadiene/styrene copolymer (ABS). Cable: polyvinyl chloride (PVC)									
	Lens cap	Polymethyl methacrylate (PMMA)									
Weight		About 63g (about 52g for contra transmitter)									

*Measure distance with maximum sensitivity

7. Sensor characteristic diagram (Take GD-T401 as an example)

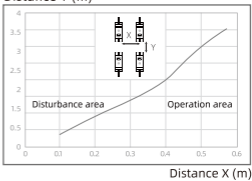
(1) Light spot diameter diagram

Light spot diameter (mm)



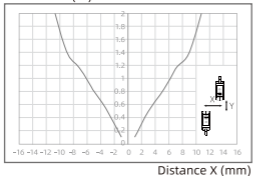
(2) Disturbance area

Distance Y (m)



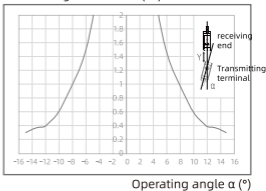
(3) Parallel mobility of optical axis

Distance Y (m)



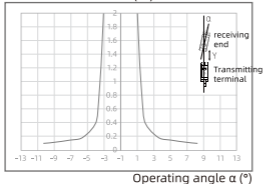
(4) Detection distance of transmitting end deflection angle

Monitoring distance Y (m)



(5) Deviation angle detection distance at the receiving end

Detection distance Y (m)





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