

产品使用说明

光电传感器

HSE-S系列	资料编号	HSE-S 说明书
	版本号	1.2
	制作日期	2024年09月

感谢您购买并使用禾川科技股份有限公司研发、生产的光电传感器。

使用时, 请务必遵守以下内容:  
使用本产品前, 请仔细阅读本说明书, 充分了解产品。

1. 安全指南

1.1 安全图标

⚠注意

• 如果不正确使用, 有可能导致死亡或重大伤害。

• 不可将传感器连接交流电源, 有爆裂的危险。

1.2 安全规则

⚠危险

• 以下项目在安全确保方面非常重要, 请务必遵守。

(1) 请不要在具有可燃性、爆炸性气体的环境下使用。

(2) 请勿拆卸、修理、改造本产品。

(3) 电源电压必须在额定值内 (DC12~24V±10%)。

(4) 请使用额定值以下的负载。

2. 产品概要

2.1 命名规则

HSE - S T 1 5 0 A N O - M 8

产品系列

HSE 禾川光电传感器系列

检测距离

150 检测数值

A 表示00

常开常闭

空白 常开+常闭

O 常开

C 常闭

输出方式

N NPN输出

P PNP输出

R 继电器输出

接线方式

空白 导线引出

M8 M8接插件中继

M12 M12接插件中继

产品外形

S 标准方形

R 圆柱形

L 小型

M 超小型

检测类型

T 对射型

R 回归反射型

D 漫反射型

B 背景抑制型

F TOF型

⚠注意

(1) 请勿在以下场所使用

①日光直射场所。

②湿度高或易结露场所。

③含腐蚀性气体场所。

④振动或冲击能直接传送到传感器场所。

(2) 连接和安装

①传感器最大允许电压是DC26.4V。通电前请确认供电电压小于最大允许电压。

②传感器导线和动力线或电力线装在同一配管中使用时, 会受到干扰, 有误动作, 甚至被损坏, 原则上传感器导线必须单独放置或者采取屏蔽措施。

③延长导线必须使用截面积0.3mm²以上的导线、延迟长度不超过100m。

④加在导线上的力请参考以下数值。

拉伸80N以下、扭矩0.1N·m以下、押压20N以下、弯曲3kg以下。

⑤安装传感器时, 请勿使传感器受剧烈外力 (如用锤击打等), 这样就有可能破坏传感器防水保护性能。安装时请使用M 3螺栓固定。

(3) 清洁

因为稀释剂类会溶化产品表面, 所以请避免使用。

(4) 电源

使用市场上销售的开关整流器时, 请将FG (Frame•Ground端子) 接地。

(5) 电源重置时间

从接通电源到传感器可正常进行检出的时间是100ms, 所以请在通电100ms后再使用。负载和传感器接不同电源时, 一定要先接通传感器的电源。

(6) 电源关闭

电源关闭时, 可能会出现输出脉冲, 所以我们建议先关闭负载或负载线的电源。

(7) 负载短路保护

①本类传感器具有负载短路保护功能。但也请避免将负载短路。

②勿使超过额定的电流通过负载。

③发生负载短路时, 输出会变成OFF, 请先关闭电源, 对回路进行修正后再接通电源。

(8) 废弃时, 请作为工业废弃物处理。

2.2 技术参数

项目	型号	检测方式	检测方式	对射型	回归反射型	漫反射型/背景抑制型						
						HSE-SD/SB0100N	HSE-SD/SB0300N					
导线引出	NPN输出	PNP输出	导线引出	HSE-ST150AN	HSE-SR4000N	HSE-SD/SB0100P	HSE-SD/SB0300P					
				HSE-ST150AP	HSE-SR4000P	HSE-SD/SB0100P	HSE-SD/SB0300P					
检测物体			直径≥5mm不透明物	直径≥12mm不透明物	100×100mm白色画纸							
光源 (波长)			640nm红色LED									
电源电压			DC12~24V 脉动 (P-P) 10%以下 (DC10~30)									
消耗电流			≤25mA		≤45mA							
控制输出			负载电源电流100mA以下 (残留电压1V以下)									
回路保护			浪涌保护回路, 短路保护, 极性反接保护									
响应时间			动作/回复 各1.0ms以下									
指示灯			动作指示灯 (橙色)									
环境温度			动作时: -25~55℃ (无结冰, 无结霜) 保存时: -40~70℃ (无结冰, 无结霜)									
环境光照			日光: 10000LX以下 白炽灯: 3000LX以下									
环境湿度			动作时: 45%~85% (无结冰) RH 保存时: 35%~85% (无结冰) RH									
电压的影响			额定电源电压范围±15%以内波动时, 检测距离±1%以内变化									
绝缘阻抗			20MΩ以上 (DC500兆欧表) 充电部与外壳间									
介电强度			AC1000V以上在50/60Hz 1min充电部与外壳间									
震动 (耐久)			10-50Hz, 1.5mm双振幅, 在X, Y, Z各方向达到1h									
冲击 (耐久)			500m/s²双振幅, 在X, Y, Z各方向3次									
防护等级			IP64									
链接方式			导线引出型 (标准2m)									

2.3 输出回路图

输出形式

NPN输出

型号

HSE-□□□□□N

输出回路

动作指示灯 (橙色)

电源指示灯 (绿色)

光电传感器主电路

棕色 DC12~24V

黑色 入光动作

蓝色 100mA 以下 (控制输出)

白色 0V 遮光动作

负载 (继电器)

输出形式

PNP输出

型号

HSE-□□□□□P

输出回路

动作指示灯 (橙色)

电源指示灯 (绿色)

光电传感器主电路

棕色 DC12~24V

黑色 入光动作

蓝色 100mA 以下 (控制输出)

白色 0V 遮光动作

负载 (继电器)

2.4 外型尺寸图

HSE-□□□□□□

11.2

31.2

20.4

25.3

2-M3

耐曲折导线φ3.2mm 3芯 (导体截面积0.2mm² 绝缘体直径φ1.1mm) 标准长度2+0.1m

使用须知

①为了确保安全, 直接或间接用于人体检测时, 请勿使用本产品。

②使用于下列用途时, 与本公司销售人员商谈之后, 根据规格书等确认的同时, 对额定值性能方面请想出有余裕度的使用方法及采取即使万一出现故障也能使危险降低到最小的安全回路等的安全对策。

a) 室外的用途、潜在化学污染或者受到电气的妨害的用途或者在商品目录、使用说明书等中没有记载的条件及环境下使用。

b) 核能控制设备、焚烧设备、铁道•航空•车辆设备、医疗设备、娱乐机械、安全装置及行政机关及根据个别业界的规定制造的设备。

c) 可能危及生命、财产的系统•机械•装置

d) 煤气、水道、电气的供给系统记24小时连续运转系统等需要高信赖的设备。

e) 其他, 以上述的 a) ~ d) 为基准, 需要高度安全性的用途。

\* 上述内容是适用条件的一部分。仔细阅读本公司的综合商品目录、数据表等最新版商品目录、手册中记载的保证免责事项的内容后再使用。



HCFA HSE-S series Photoelectric sensors

## INSTRUCTION SHEET

Photoelectric sensors

# HSE-S

vender ID	HSE-S instructions
Version	1.2
Date	September 2024

Thank you for selecting HCFA product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product

### 1. Safety precautions

#### 1.1 Safety symbols

### ⚠CAUTION

- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
- Do not connect sensor to AC power supply.

#### 1.2 Safety rules

### ⚠DANGER

- Be sure to follow the safety precautions below for added safety.
  - (1)Do not use the sensor under the environment with explosive origination gas.
  - (2)Never disassemble, repair nor tamper with the product.
  - (3)Keep the supply voltage within the specified range (12to24V DC±10%)
  - (4)Do not use the sensor over the rated values.

### 2. Product Overview

#### 2.1 Model name description

## HSE - S T 1 5 0 A N O - M 8

Series name		Detection distance		Normally-open/closed	
HSE	HCFA sensors	150	Indicate directly	N/A	Normally-open/closed
		A	Indicate 00	O	Normally-open
				C	Normally- closed
Product overview		Detection type		Output type	
S	Standard square	T	Correlation type	N	NPN output
R	Cylindrical	R	Retroreflective type	P	PNP output
L	Small-size	D	Diffuse reflection type	R	Relay output
M	Mini-type	B	Background suppression type		
		L	Limited reflective type	Connection method	
		F	TOF type	N/A	Leadwire type
				M8	M8 connector relay
				M12	M12 connector relay

### ⚠CAUTION

(1)Do not use the product under the following conditions.

- In the place exposed to the direct sunlight.
- In the place where humidity is high and condensation may occur.
- In the place where corrosive gas exists.
- In the place where vibration or shock is directly transmitted to the product.

(2) Connection and Mounting

- Be sure that before making supply the supply voltage is less than the maximum rated supply voltage.(26.4V DC)
  - There are some cases where the photoelectric switch cable is unavoidably laid in a tube or duct together with a hightension or power line  
In principal, the cable should be separately laid or shielded
- For extending wires,use a cable 0.3mm² min,and 100m max .in length.When using the cable as a Korea's S-mark certified product,use the cable of less than 10m in length.
- Do not exceed the following force values applied to the cable.  
Tensile:80N max.,torque:0.1N·m max.,pressure:20N max.,flexure:3kg max
- Excessive force (hitting by nammer,etc.) should not be put on the photoelectric switch because it may damage its water-resistance characteristic. Use M3 screws to mount the photoelectric switch.

(3)Cleaning

Do not use thinner such as alcohol and benzine because it may melt a surface of a product.

(4)Power supply

When using a commercially available switching regulator, be sure to ground the FG (Frame Ground) terminals.

(5)Power supply reset time

The photoelectric switch will begin sensing no later than 100ms after the power is turned on. If the load and the photoelectric switch is connected to different power supply, the photoelectric switch must be always turned on first.

(6)Turning off the power supply

When turning off the power, output pulse may be generated. We recommend turning off the power supply of the load or load line first.

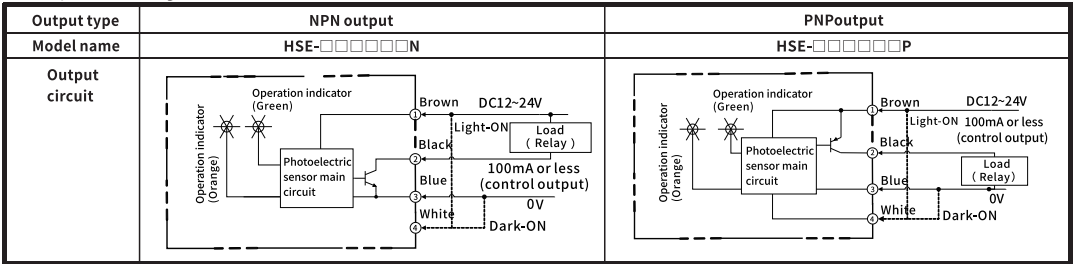
(7)Load short circuit protection

- This product is provided with function of load short circuit protection. However, be never short-circuited of the load.
- Please do not throw thecurrent that exceeds ratings into the load.
- Controloutput is turned off when this function operates. After checking of wiring and load current, make power supply again. Then the circuit is reset.

#### 2.2 Technical parameters

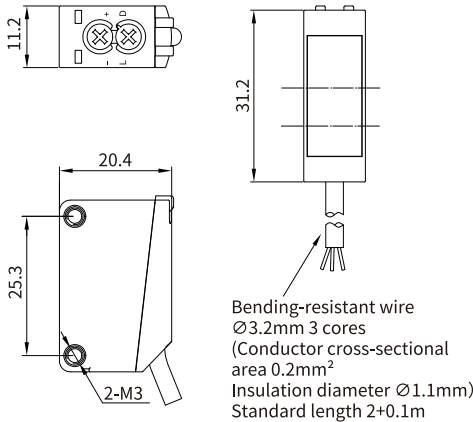
		Detection method		Correlation type	Retroreflective type	Reflection type	
Items	Models	NPN output	Leadwire type	HSE-ST150AN	HSE-SR4000N	HSE-SD0100N	HSE-SD0300N
		PNP output		HSE-ST150AP	HSE-SR4000P	HSE-SD0100P	HSE-SD0300P
Detection objects				100×100mmWhite paper	Diameter≥5mmOpaque material		Diameter≥12mmOpaque material
Light source(wavelength)				640nm red LED			
Power voltage				DC12-24V, ripple (P-P) 10% max (DC10-30)			
Current consumption				≤25mA		≤45mA	
Control output				Load current 100mA or less(residual voltage 1V or less)			
Circuit protection				Surge protection circuit, short circuit protection, reverse polarity protection			
Response time				1.0 ms or less for both operation and response			
Indicators				Operation indicator (Orange)			
Ambient temperature				Operating: -25~55°C (no freezing, no condensation) Storage: -40~70°C (no freezing, no condensation)			
Ambient light				Daylight: 10000LX or less Incandescent lamp: 3000LX or less			
Ambient humidity				Operating: 45%~85%(no freezing) RH Storage: 35%~85%(no freezing) RH			
Voltage influence				The rated power supply voltage fluctuates within ±15%, the detection distance varies within ±1%			
Insulation resistance				20MΩ or more (DC500 megohmmeter) between the charging part and the shell			
Dielectric strength				1000VAC and above, 50/60Hz 1min between the charging part and the shell			
Vibration (durable)				10-50Hz, 1.5mm double amplitude, 1h in each direction of X, Y, Z			
Impact (durable)				500m/s² double amplitude, 3 times in each direction of X, Y, Z			
Protection level				IP65			
Connection method				Leadwire type(standard 2m)			

#### 2.3 Output circuit diagram



#### 2.4External Dimensions

HSE-□□□□□□



### Operation Instruction

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES

Take all necessary steps to determine the suitability of the product for the systems,machines,and equipment with which it will be used

Know and observe all prohibitions of use applicable to this product

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE HCFA PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSYEM.

See also Product catalog for Warranty and limitation of Liability