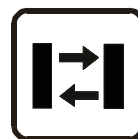
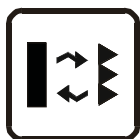
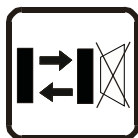
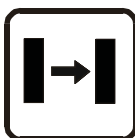


Miniature Photoelectric: SA1E

Simple, Compact Design for Worldwide Usage



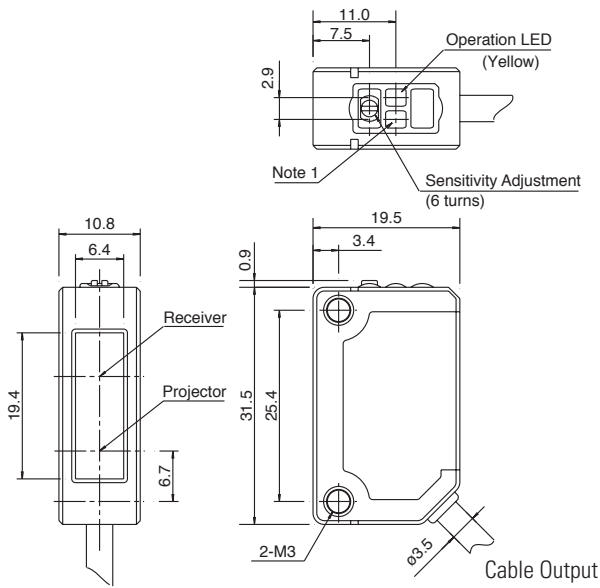
- Six sensing methods
- 1m proximity, 15cm with narrow beam
- 4m polarized retro-reflective
- 15m through-beam
- Standard 3 wire output configuration
- Cable and M8 connector types available
- NPN output, PNP output, Light On, Dark On options
- Long sensing ranges, high-speed response
- CE marked, UL Listed

Ensuring the accurate recognition of target objects is critical for many control systems. Reliable object recognition means fewer false alarms, increased productivity and less product rejection. When selecting sensors for your applications, the most important criteria to consider are: reliability, durability and ruggedness.

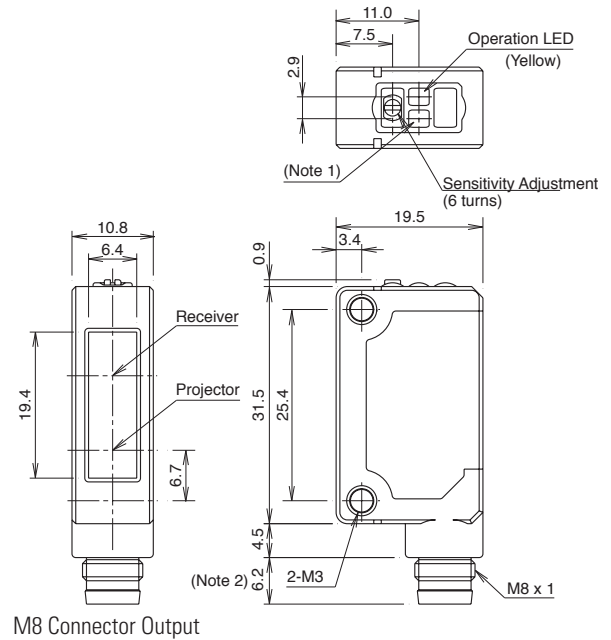
The miniature SA1E photoelectric sensors incorporate all of these features in a compact housing, and are also easy-to-install and competitively priced. All SA1E photoelectric sensors are IP67 rated, UL/c-UL listed and CE marked. A choice of NPN or PNP outputs are available, as well as a choice of Dark ON or Light ON operation modes.

Dimensions (mm)

Cable Models



Connector Models



Note 1: Stable LED is not provided on the background suppression type.

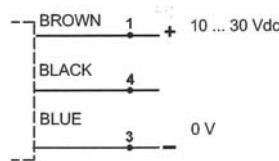
Note 2: The connector length is 18mm when a right-angle connector cable (SA9Z-CM8K-4L*) is attached.

Indicators & Settings

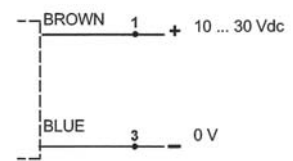


Connections

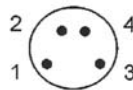
SA1E-B, SA1E-D, SA1E-N, SA1E-P



SA1E-T



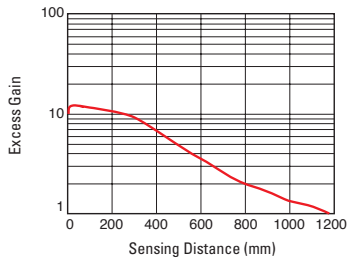
M8 Connector



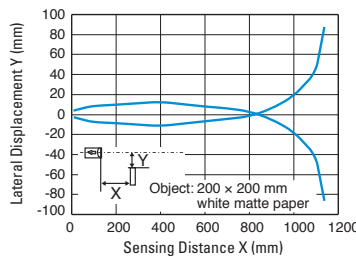
For information on accessories, see page 171.

Diffuse-reflective SA1E-D

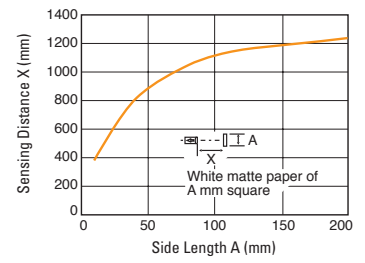
Excess Gain



Lateral Displacement

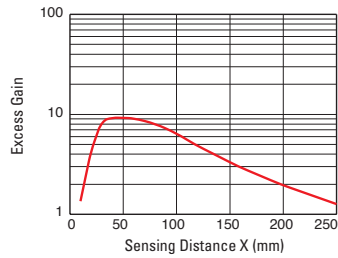


Object Size vs. Sensing Distance

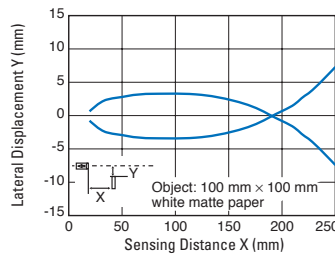


Small-beam Reflective SA1E-N

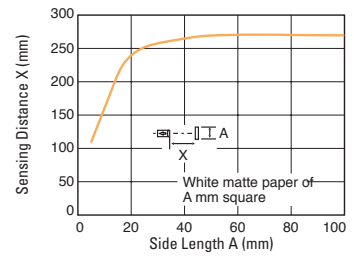
Excess Gain



Lateral Displacement

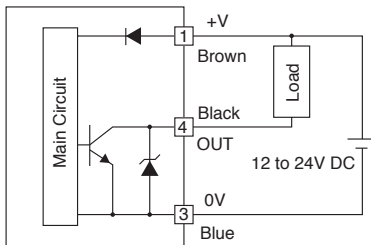


Object Size vs Sensing Distance

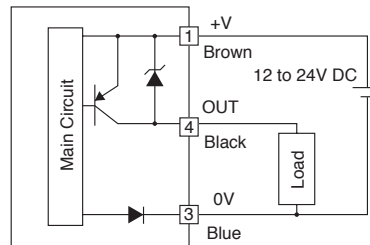


Output Circuit & Wiring Diagrams

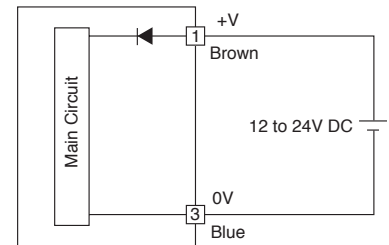
NPN Output



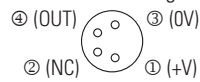
PNP Output



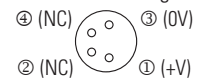
Through-beam Emitter



Connector Pin Assignment



Connector Pin Assignment



Specifications






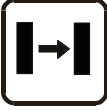
		SA1E-P**2M	SA1E-N**2M	SA1E-D**2M	SA1E-T**2M	SA1E-B**2M	SA1E-G**2M	SA1E-P**C	SA1E-N**C	SA1E-D**C	SA1E-T**C	SA1E-B**C	SA1E-G**C
Narrow Beam Proximity Operating Distance	50 - 150mm	-	√	-	-	-	-	-	√	-	-	-	-
Diffuse Proximity Operating Distance	0 - 700mm	-	-	√	-	-	-	-	-	√	-	-	-
Polarized Retro-reflective Operating Distance	0.08 - 3m (on R5)	√	-	-	-	-	-	√	-	-	-	-	-
Through-beam Operating Distance	0 - 15m	-	-	-	√	-	-	-	-	-	√	-	-
Background Suppression Distance	250 - 200mm	-	-	-	-	√	-	-	-	-	-	√	-
Convergent	5 to 35mm	-	-	-	-	-	√	-	-	-	-	-	√
Power Supply	10 - 30V DC ¹	√	√	√	√	√	√	√	√	√	√	√	√
Current Draw	Projector: 15mA, Receiver 20mA	-	-	-	√	-	-	-	-	-	√	-	-
	30mA max.	√	√	√	-	√	√	√	√	√	-	√	√
Light Emission ²	Red LED 665nm	√	√	-	√	√	-	√	√	-	√	√	-
	Infrared LED 870nm	-	-	√	√	-	√	-	-	√	√	-	√
Setting	Sensitivity adjustment	√	√	√	√	√	√	√	√	√	√	√	√
Indicators	Yellow OUTPUT LED	√	√	√	√	√	√	√	√	√	√	√	√
	Green STABILITY LED	√	√	√	√	-	-	√	√	√	√	-	-
	Green POWER ON LED	√	√	√	√	-	-	√	√	√	√	-	-
Output Type	PNP or NPN (refer to part number table)	√	√	√	√	√	√	√	√	√	√	√	√
Operating Mode	Dark On or Light On (refer to part number table)	√	√	√	√	√	√	√	√	√	√	√	√
Saturation Voltage	≤ 2V	√	√	√	√	√	√	√	√	√	√	√	√
Response Time	1ms	√	√	√	√	√	√	√	√	√	√	√	√
Switching Frequency	500Hz	√	√	√	√	√	√	√	√	√	√	√	√
Output Current	≤ 100mA	√	√	√	√	√	√	√	√	√	√	√	√
Connection	2m cable, Ø 3.5mm	√	√	√	√	√	√	-	-	-	-	-	-
	4-pole M8 connector	-	-	-	-	-	-	√	√	√	√	√	√
Mechanical Protection	IP67	√	√	√	√	√	√	√	√	√	√	√	√
Protection Devices	A, B ³	√	√	√	√	√	√	√	√	√	√	√	√
Housing Material	PC / PBT	√	√	√	√	√	√	√	√	√	√	√	√
Lens Material	PMMA	√	-	-	-	-	-	√	-	-	-	-	-
	PC	-	√	√	√	√	√	-	√	√	√	√	√
Weight	10g	-	-	-	-	-	-	√	√	√	√	-	√
	20g	-	-	-	-	-	-	-	-	-	-	√	-
	30g	√	√	√	√	-	-	-	-	-	-	-	-
	50g	-	-	-	-	-	√	-	-	-	-	-	-
	55g	-	-	-	-	√	-	-	-	-	-	-	-
Operating Temperature	-25 to +55°C	√	√	√	√	√	√	√	√	√	√	√	√
Storage Temperature	-40 to +70°C	√	√	√	√	√	√	√	√	√	√	√	√
Standard Reference	EN60947-5-2	√	√	√	√	√	√	√	√	√	√	√	√



1. Limit values
2. Average life of 100,000 hrs with T_A = +25°C
3. A - reverse polarity protection
B - overload and short-circuit (SA1E-P, SA1E-N, SA1E-D, SA1E-T)



Part Numbers

Function	Operation Mode	Output	Cable Type	Cable Length	Weight	Dimensions	Part Number
 Convergent	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-GN1-2M
	Light On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-GN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-GN2-2M
	Dark On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-GN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-GP1-2M
	Light On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-GP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-GP2-2M
	Dark On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-GP2C
 Background Suppression (Fixed Field)	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-BN1-2M
	Light On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-BN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-BN2-2M
	Dark On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-BN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-BP1-2M
	Light On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-BP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-BP2-2M
	Dark On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-BP2C
 Diffuse Reflective	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-DN1-2M
	Light On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-DN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-DN2-2M
	Dark On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-DN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-DP1-2M
	Light On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-DP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-DP2-2M
	Dark On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-DP2C
 Small Beam Reflective	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-NN1-2M
	Light On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-NN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-NN2-2M
	Dark On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-NN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-NP1-2M
	Light On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-NP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-NP2-2M
	Dark On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-NP2C
 Polarized Retro-reflective	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-PN1-2M
	Light On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-PN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-PN2-2M
	Dark On	NPN	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-PN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-PP1-2M
	Light On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-PP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-PP2-2M
	Dark On	PNP	M8 Connector	–	10g	42.3 x 10.8 x 19.5mm	SA1E-PP2C
 Through-beam	Light On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-TN1-2M
	Light On	NPN	M8 Connector	–	20g	42.3 x 10.8 x 19.5mm	SA1E-TN1C
	Dark On	NPN	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-TN2-2M
	Dark On	NPN	M8 Connector	–	20g	42.3 x 10.8 x 19.5mm	SA1E-TN2C
	Light On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-TP1-2M
	Light On	PNP	M8 Connector	–	20g	42.3 x 10.8 x 19.5mm	SA1E-TP1C
	Dark On	PNP	Cable	2m	50g	31.5 x 10.8 x 19.5mm	SA1E-TP2-2M
	Dark On	PNP	M8 Connector	–	20g	42.3 x 10.8 x 19.5mm	SA1E-TP2C