



Subminiature Photoelectric Sensors
(Built-in Amplifier)

SA1N



Space-Saving Subminiature Photoelectric Sensors

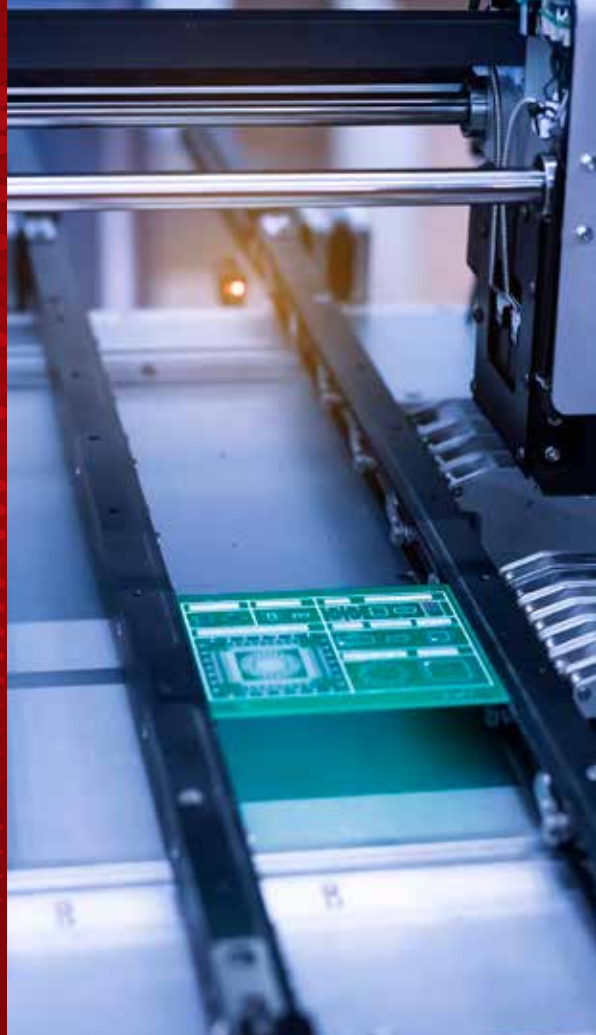
Compact equipment, high accuracy and performance

IDEC CORPORATION

The trend towards automation continues and the role that sensing devices play is ever more important. Photoelectric sensors need to meet various demands, including the need for miniaturization, greater detection distances, increased accuracy, and faster response times.

To meet these needs, IDEC has added the SA1N Subminiature Photoelectric Sensor to the product lineup. It significantly contributes to equipment downsizing. As extra installation space for a separate amplifier is not required, the sensor can be mounted and used in applications where solutions were previously limited to fiber optic sensing heads.

IDEC will continue to provide a range of sensing products designed to address sensor related needs.



Features



Can be installed in tight spaces where general-purpose sensors don't fit.

Built-in amplifier reduces installation space
(no extra space required for the amplifier)

Sensitivity adjustment control
(both fiber type and block type)



SA1N-D

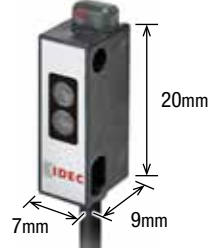


SA1N-G

Stainless steel housing/plastic encapsulation for IP67 rating, dust and water resistance (fiber type only)



Lineup

				
Part No.	SA1N-DN1VF50-2M	SA1N-DP1VF50-2M	SA1N-GN1V30-2M	SA1N-GP1V30-2M
Type	Fiber type		Block type	
Sensing Method	Diffuse-reflective		Convergent-reflective	
Sensing Range				
Output Method	NPN	PNP	NPN	PNP
Light Source (Emitter)	Infrared LED		Red LED	
Response Time	0.5ms maximum			
Operation Mode	Light on			
Control Output	NPN/PNP open collector			
Current Draw	20mA maximum		27mA maximum	35mA maximum
Degree of Protection	IP67 (IEC 60529)		IP64 (IEC 60529)	
Operating Temperature	-25 to +55°C			

Application Examples

I Sensing



Parts feeder



Medical equipment



Bottle cap conveyor lines

I Positioning / Counting



Counting components on conveyor lines



Positioning PCB conveyor lines



Detecting missing electronic components

SA1N Subminiature Photoelectric Sensors

An alternative to fiber optic sensors, for use in tight spaces

- Small sensor head can be mounted where space is limited.
- No amplifier installation space required (built-in amplifier).
- Sensitivity adjustment control simplifies post-installation adjustments.
- Cable bends easily and is simple to install. Can be mounted without concerns about bend limits and damage associated with fiber optic cables.



- See website for details on approvals and standards.



SA1N

Quantity: 1

Shape	Sensing method	Light source	Sensitivity control	Sensing range	Connector	Cable length	Operation mode	Output	Part No.
	Diffuse-reflective	Infrared LED	Sensitivity adjustment control	3 to 50mm	Cable	2m	Light ON	NPN output	SA1N-DN1VF50-2M
								PNP output	SA1N-DP1VF50-2M
	Convergent-reflective	Red LED	Sensitivity adjustment control with output converter circuit	5 to 30mm	Cable	2m	Light ON	NPN output	SA1N-GN1V30-2M
								PNP output	SA1N-GP1V30-2M

Specifications

Part No.	SA1N-DN1VF50-2M	SA1N-DP1VF50-2M	SA1N-GN1V30-2M	SA1N-GP1V30-2M
Sensing method	Diffuse-reflective		Convergent-reflective	
Operation mode	Light on			
Output style	NPN output	PNP output	NPN output	PNP output
Sensing range	3 to 50mm		5 to 30mm	
Standard sensing object	White drawing paper: 100 x 100mm		White drawing paper: 50 x 50mm	
Light source (emitter)	Infrared LED		Red LED	
Rated operating voltage	12 to 24V±10% DC, ripple (p-p): 10% maximum			
Current draw	20mA maximum		27mA maximum	35mA maximum
Control output	NPN/PNP open collector output, load power voltage: 30V DC maximum (load current: 80mA maximum)			
Protection circuit	Power supply reverse polarity protection, output short-circuit protection			
Response time	0.5ms maximum			
Hysteresis	Less than 10% of sensing range		Less than 10% of sensing range	
Indicator	Operating status: orange LED Stable status: green LED		Operating status: red LED Stable status: green LED	
Adjustment	Sensitivity adjustment control available (*1)		Sensitivity adjustment relay volume control available (*2)	
Materials	Enclosure/screw nut/internal tooth lock washer: SUS303 Lens: PSU		Enclosure: LCP (filler: PP) Lens: PC	
Cable	Cable cord (pull out type) , outer diameter ø2.8mm, length 2m, 0.15mm² x 3-core			
Weight (approx.)	30g		40g	
Accessories	Screw nut, internal tooth lock washer, screwdriver (for adjusting)		Screw nut, internal tooth lock washer, screwdriver (for adjusting), mounting screw	
Operating temperature	-25 to +55% (no freezing, no condensation)		-25 to +55% (no freezing, no condensation)	
Storage temperature	-40 to +70% (no freezing, no condensation)		-40 to +70% (no freezing, no condensation)	
Operating humidity	35 to 85%RH (no condensation)			
Ambient illuminance	2,000m maximum			
Insulation resistance	500V DC megger 20MΩ minimum			
Dielectric strength	500V AC, 1 minute			
Vibration resistance	10 to 55 Hz, amplitude 1.5 mm, 2 hours each in X, Y, and Z directions			
Shock resistance	500m/s², 3 times each in X, Y, and Z directions			
Degree of protection	IP67 (IEC 60529)		IP64 (IEC 60529)	

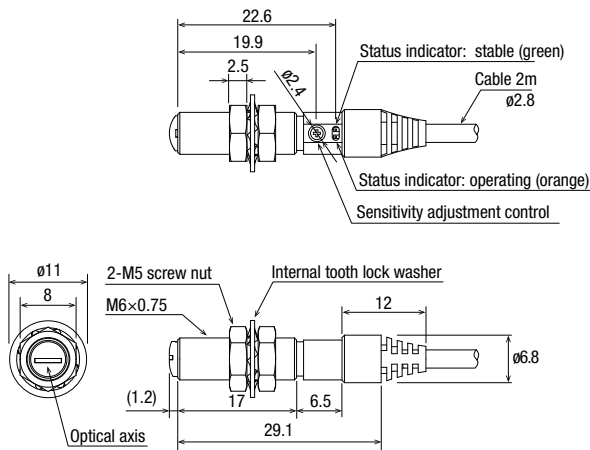
*1) When operating the sensitivity adjustment control or output conversion unit, use the supplied screwdriver and apply a torque of 0.8N·cm maximum.

*2) When operating the sensitivity adjustment relay volume control or the output conversion unit, use the supplied screwdriver and apply a torque of 0.1N·m maximum.

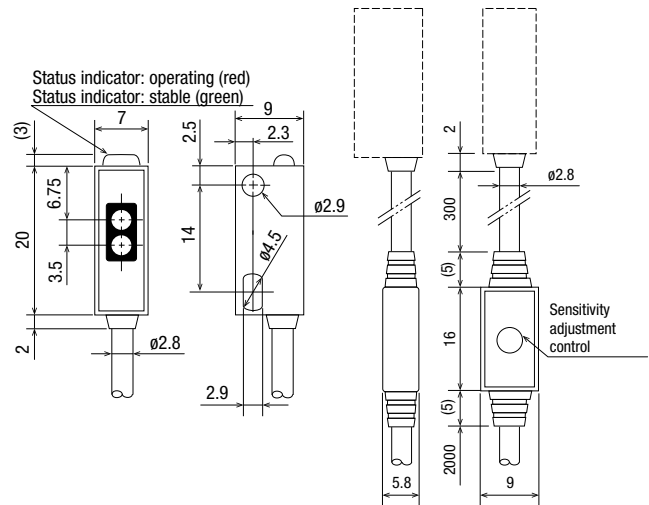
Dimensions

All dimensions in mm

SA1N-DN1VF50-2M / SA1N-DP1VF50-2M

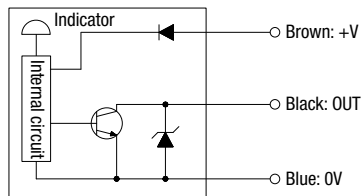


SA1N-GN1V30-2M / SA1N-GP1V30-2M

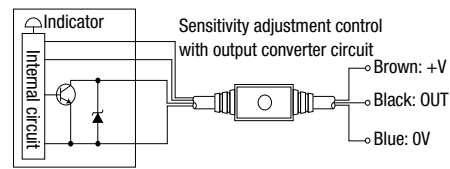


Wiring

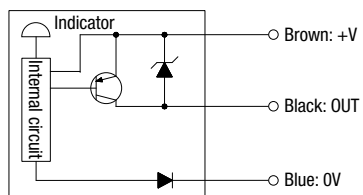
SA1N-DN1VF50-2M



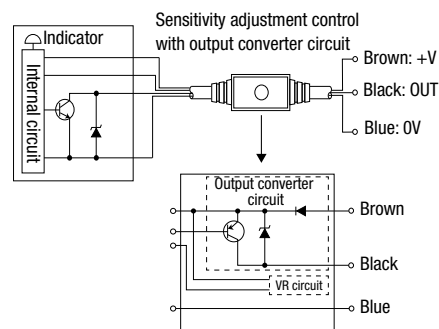
SA1N-GN1V30-2M



SA1N-DP1VF50-2M

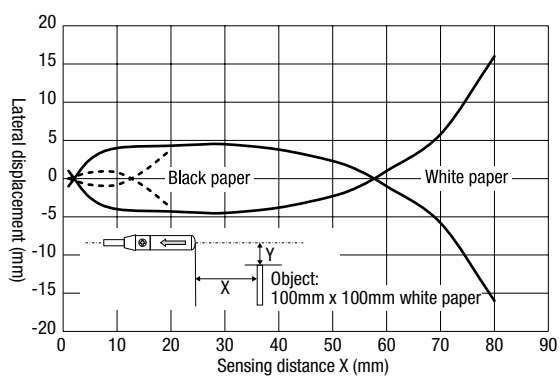


SA1N-GP1V30-2M

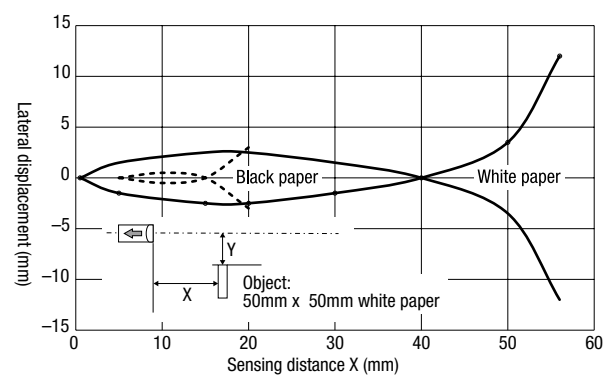


Characteristics

SA1N-DN1VF50-2M / SA1N-DP1VF50-2M



SA1N-GN1V30-2M / SA1N-GP1V30-2M



Safety Precautions

Turn off the power to the product before starting installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shock or fire.

Instructions

SA1N-D

- Lenses and cases should be cleaned with a soft cloth. Since PMMA is used as the material for the optical part, do not use organic solvents such as ammonia, sodium hydroxide, alcohol, or thinner.
- Wiring should be separated from power lines and high-voltage lines, or shielded wires should be used. If wiring is placed in the same pipe or duct, induction may cause malfunction or damage.
- This product operates 100ms after power-on. Turn on the power supply before the load.
- This product may generate output pulses when the power is turned off. Ensure that the power supply on the load side is turned off first.
- Avoid continuously turning the power on and off.
- This product has an IP67 protection rating but should not be used in areas constantly sprayed with water or underwater.
- Be sure to use the supplied screw nuts and internal tooth lock washers for installation.
- If the screw nut on the main unit is tightened with excessive force, the threads may be crushed, and the screw nut may loosen (the tightening torque is a maximum of 1N·m).
- High-frequency lighting, fluorescent lamps, inverters, and other high-frequency devices may emit light or noise that is similar to the modulation frequency of this sensor. Install the sensor in a way that prevents direct entry of light from sunlight or fluorescent lamps onto the detection surface.
- Note that connecting a capacitor or coil to the load may cause overcurrent to flow.
- When using a high-capacity switching power supply, make sure to insert a fuse or breaker that matches the number of sensors used.
- Do not use a power supply outside the rated operating voltage range or apply AC power. Otherwise, explosion or burning may occur.
- In the event of a load short circuit or overload, the output transistor will turn off. Check the condition of the load and then turn the power back on.
- When using a DC power supply with an isolated transformer or when using a switching power supply, ensure to ground the FG terminal.
- When extending the wiring, use cables with a cross-sectional area of 0.3mm² minimum and a length of 10m maximum. Also, take note of the voltage drop.
- The current limit of the power source should be 1A, which is appropriate for the sensor cable size.

SA1N-G

- Lenses and cases should be cleaned with a soft cloth. Since PMMA is used as the material for the optical part, do not use organic solvents such as ammonia, sodium hydroxide, alcohol, or thinner.
- Wiring should be separated from power lines and high-voltage lines, or shielded wires should be used. If wiring is placed in the same pipe or duct, induction may cause malfunction or damage.
- This product operates 20ms after power-on. Turn on the power supply before the load.
- This product may generate output pulses when the power is turned off. Ensure that the power supply on the load side is turned off first.
- Avoid continuously turning the power on and off.
- This product has a IP64 protection rating but should not be used in areas constantly sprayed with water or underwater.
- Be sure to use the supplied M2.6 x 12 mm screws, internal tooth lock washers, and screw nuts for installation.
- Excessive tightening may cause damage.
* Recommended tightening torque: 0.1N·m
- High-frequency lighting, fluorescent lamps, inverters, and other high-frequency devices may emit light or noise that is similar to the modulation frequency of this sensor. Install the sensor in a way that prevents direct entry of light from sunlight or fluorescent lamps onto the detection surface.
- Note that connecting a capacitor or coil to the load may cause overcurrent to flow.
- When using a high-capacity switching power supply, make sure to insert a fuse or breaker that matches the number of sensors used.
- Do not use a power supply outside the rated operating voltage range or apply AC power. Otherwise explosion or burning may occur.
- In the event of a load short circuit or overload, the output transistor will turn off. Check the condition of the load and then turn the power back on.
- When using a DC power supply with an isolated transformer or when using a switching power supply, ensure to ground the FG terminal.
- When extending the wiring, use cables with a cross-sectional area of 0.3mm² minimum and a length of 10m maximum. Also, take note of the voltage drop.
- The current limit of the power source should be 1A, which is appropriate for the sensor cable size.

Be sure to read the instruction manual carefully before performing installation, wiring, or maintenance.

For details on mounting, wiring, and maintenance, see the instruction manual from the below URL.

- SA1N-D <https://product.idec.com/?product=SA1N-D>
- SA1N-G <https://product.idec.com/?product=SA1N-G>



SA1N-D



SA1N-G

Ordering Terms and Conditions

Thank you for using IDEC Products.

By purchasing products listed in our catalogs, datasheets, and the like (hereinafter referred to as "Catalogs") you agree to be bound by these terms and conditions. Please read and agree to the terms and conditions before placing your order.

1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of IDEC products listed in this Catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.
Also, durability varies depending on the usage environment and usage conditions.
- (2) Reference data and reference values listed in Catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (3) The specifications / appearance and accessories of IDEC products listed in Catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (4) The content of Catalogs is subject to change without notice.

2. Note on applications

- (1) If using IDEC products in combination with other products, confirm the applicable laws / regulations and standards.
Also, confirm that IDEC products are compatible with your systems, machines, devices, and the like by using under the actual conditions. IDEC shall bear no liability whatsoever regarding the compatibility with IDEC products.
- (2) The usage examples and application examples listed in Catalogs are for reference purposes only. Therefore, when introducing a product, confirm the performance and safety of the instruments, devices, and the like before use. Furthermore, regarding these examples, IDEC does not grant license to use IDEC products to you, and IDEC offers no warranties regarding the ownership of intellectual property rights or non-infringement upon the intellectual property rights of third parties.
- (3) When using IDEC products, be cautious when implementing the following.
 - i. Use of IDEC products with sufficient allowance for rating and performance
 - ii. Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that an IDEC product fails
 - iii. Wiring and installation that ensures the IDEC product used in your system, machine, device, or the like can perform and function according to its specifications
- (4) Continuing to use an IDEC product even after the performance has deteriorated can result in abnormal heat, smoke, fires, and the like due to insulation deterioration or the like. Perform periodic maintenance for IDEC products and the systems, machines, devices, and the like in which they are used.
- (5) IDEC products are developed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use an IDEC product for these applications, unless otherwise agreed upon between you and IDEC, IDEC shall provide no guarantees whatsoever regarding IDEC products.
 - i. Use in applications that require a high degree of safety, including nuclear power control equipment, transportation equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.), equipment for use in outer space, elevating equipment, medical instruments, safety devices, or any other equipment, instruments, or the like that could endanger life or human health
 - ii. Use in applications that require a high degree of reliability, such as provision systems for gas / waterworks / electricity, etc., systems that operate continuously for 24 hours, and settlement systems
 - iii. Use in applications where the product may be handled or used deviating from the specifications or conditions / environment listed in the Catalogs, such as equipment used outdoors or applications in environments subject to chemical pollution or electromagnetic interference
If you would like to use IDEC products in the above applications, be sure to consult with an IDEC sales representative.

3. Inspections

We ask that you implement inspections for IDEC products you purchase without delay, as well as thoroughly keep in mind management/maintenance regarding handling of the product before and during the inspection.

4. Warranty

(1) Warranty period

The warranty period for IDEC products shall be one (1) year after purchase or delivery to the specified location. However, this shall not apply in cases where there is a different specification in the Catalogs or there is another agreement in place between you and IDEC.

(2) Warranty scope

Should a failure occur in an IDEC product during the above warranty period for reasons attributable to IDEC, then IDEC shall replace or repair that product, free of charge, at the purchase location / delivery location of the product, or an IDEC service base. However, failures caused by the following reasons shall be deemed outside the scope of this warranty.

- i. The product was handled or used deviating from the conditions / environment listed in the Catalogs
 - ii. The failure was caused by reasons other than an IDEC product
 - iii. Modification or repair was performed by a party other than IDEC
 - iv. The failure was caused by a software program of a party other than IDEC
 - v. The product was used outside of its original purpose
 - vi. Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and Catalogs
 - vii. The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from IDEC
 - viii. The failure was due to other causes not attributable to IDEC (including cases of force majeure such as natural disasters and other disasters)
- Furthermore, the warranty described here refers to a warranty on the IDEC product as a unit, and damages induced by the failure of an IDEC product are excluded from this warranty.

5. Limitation of liability

The warranty listed in this Agreement is the full and complete warranty for IDEC products, and IDEC shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to an IDEC product.

6. Service scope

The prices of IDEC products do not include the cost of services, such as dispatching technicians. Therefore, separate fees are required in the following cases.

- (1) Instructions for installation / adjustment and accompaniment at test operation (including creating application software and testing operation, etc.)
- (2) Maintenance inspections, adjustments, and repairs
- (3) Technical instructions and technical training
- (4) Product tests or inspections specified by you

The above content assumes transactions and usage within your region. Please consult with an IDEC sales representative regarding transactions and usage outside of your region. Also, IDEC provides no guarantees whatsoever regarding IDEC products sold outside your region.

Related Products

USB Connected Portable Sensor Checker

SA1P



Designed for easy portability, the portable sensor checker can test products powered by 24V DC for detection and continuity in any location. This device is suitable for use on desks or on-site and can be connected to a commercially available mobile battery. It can also be connected to a PC using a USB connector.

Miniature Photoelectric Sensors with Built-in Amplifier

SA2E



Miniature photoelectric switches with high detection accuracy and response time, suitable for various applications.

IDEC CORPORATION

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 www.idec.com

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