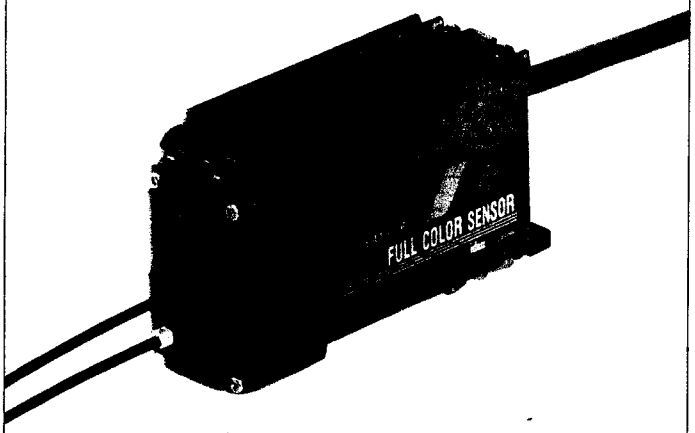
EB-314

SA1J-F

Full Color Sensors
1-Color Memory 1-Output Type
Amplifier Unit
Operating Instructions



IDEC IZUMI CORPORATION

Type No.	Output Type
SA1J-F1N1	NPN Output
SA1J-F1P1	PNP Output

* See the reverse side of the sheet for applicable fiber units.

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⚠ NOTES FOR SAFETY

The product is designed for sensing objects and is not for accident prevention or any other safety control. End-users should read this sheet of operating instructions carefully to install, wire, operate, maintain and inspect the device correctly. Make sure the instructions are delivered to end-users.

NOTES FOR INSTALLATION

- Do not locate (or use) the sensor outdoors, nearby induction devices, or heat sources. Choose locations free from frequent vibrations, shocks, dust, toxic gas, water, oil, and chemicals, so as to prevent malfunctions and damage.
- The sensing portion of the fiber must be free from dust and moisture. Any dust or moisture must be wiped off immediately with soft cloth dipped in alcohol.
- The sensor can get extremely hot depending on where it is used.
- Do not apply excessive impact on the sensor during the installation, so as not to cause damage or deterioration in the degree of protection.
- Do not expose the sensor to sunlight or other direct light projections.
- Do not apply voltage higher than the specified 1kV to the portion between the power source and the housing.
- When mounting the sensors side by side, keep a minimum clearance of 30mm from each other in any direction.
- When screwing down the cover, tightening torque should be 0.49 N-m.

SWITCH OPERATION

- Turning torque for the Inspection Tolerance Selector must not exceed 0.02 N-m (0.18 Pb-in).
- Press the Reference Color Set button securely with a force not exceeding 3N.
- Use the attached screwdriver to abjust the Inspection Tolerance Selector .

WIRING

- Connect correctly to prevent damage.
- The power voltage must not exceed the rated range.
- Do not install the sensor in the same conduit with high-voltage lines and power lines.
- When using a switching power supply, be sure to ground the FG (frame ground) terminal.
- Cable extension is allowed up to 100m using a cabtyre cable with core wires of 0.3mm^2 or more.

OPERATION AT POWER ON

- Output is forced off for approximately 2 seconds after power-up.
- To ensure a stable sensing, warm up the sensor about 15 minutes.

REFERENCE COLOR MEMORY

- Reference color memory has EEPROM and requires no back-up.

FUNCTION SPECIFICATIONS

Type No.	SA1J-F1N1	SA1J-F1P1
Power Voltage	12 to 24V DC, ripple 10% maximum (Operating Limits 10 to 30V DC)	
Current Draw	150mA maximum	
Light Source	Three LEDs (Red, Green, Blue)	
Response Time	FAST (0.3msec), NORMAL (1msec), SLOW (5msec), selectable	
Control Output	NPN open collector 30V DC, 100mA maximum Voltage Drop 1.5V maximum Protected against short circuit	PNP open collector 30V DC, 100mA maximum Voltage Drop 1.5V maximum Protected against short circuit
SET Input	30V DC maximum/ 3.6mA (when connected to 0V) Typical Operating Voltage: (0V) +4V maximum	30V DC maximum/ 3.0mA (when connected to 24V) Typical Operating Voltage: (+V) -4V minimum
External Synchronous Input		
Operation Indicator	Yellow LED	
Timer	OFF-delay timer 40msec	
Output Operation	Equivalent Output	
Operating Temperature	-10 to +50°C (no freezing)	
Storage Temperature	-30 to +70°C (no freezing)	
Operating Humidity	35 to 85% RH (no condensation)	
Extraneous Light Immunity	Sunlight: 10,000 Lx maximum, Halogen Lamp: 3,000 Lx maximum at receiver.	
Vibration Resistance	10 to 55Hz, Amplitude: 0.75mm, 2 hours each in 3 axes	
Shock Resistance	500m/s^2 (approx. 50G), 3 shocks each in 5 axes	
Degree of Protection	IP65 (When inserting the fiber unit, and tightening the cover)	
Cable	0.2mm^2, ø5.4mm 5-core vinyl cabtyre cable, 2m	
Functions: Reference Color Set	Teaching system, 1 color	
Functions: Inspection Tolerance	5-step digital setting	
Functions: Inspection Mode	Color (C) / Color+Intensity (C+I)	
Functions: Synchronous Mode	Internal Synchronous Mode (INT) / External Synchronous Mode (EXT)	
Functions: Response Mode	FAST (F) / NORMAL (N) / SLOW (S)	
Functions: OFF-delay Timer	Timer On (T-ON) / Timer Off (T-OFF)	
Material	Housing: Aluminum (Front:PBT), Cover:PAR	
Weight	Approx. 190g	
Dimensions (mm)	47H × 25W × 82.4D	
Attachments	Mounting Bracket × 1, Adjusting Screwdriver × 1	

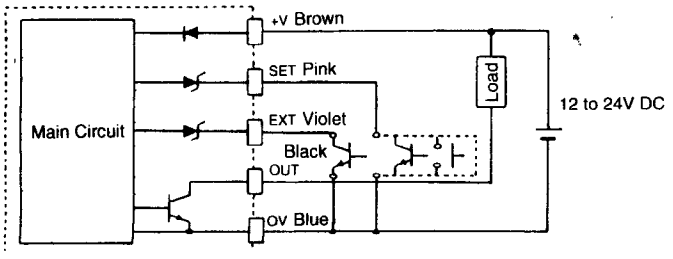
CONNECTION METHOD

• Lead Wire

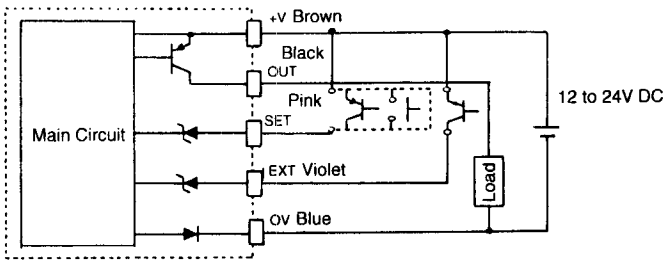
Lead Wire Color	Name	Function
Brown	+V	Power Voltage 12 to 24V
Blue	0V	Power Ground
Pink	SET	Set Input
Violet	EXT	External Synchronous Input
Black	OUT	Control Output

• CONNECTION EXAMPLE

SA1J-F1N1

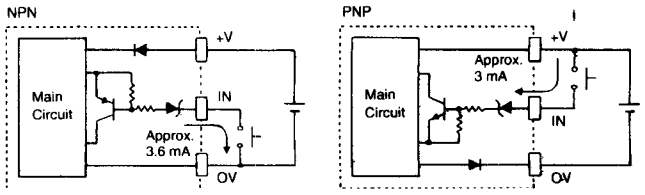


SA1J-F1P1

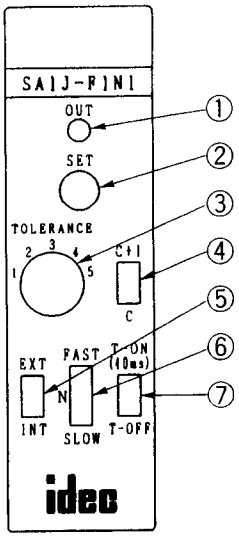


Use non-contact output sensor for external synchronous input to prevent chattering.

• Input Circuit



OPERATION PANEL (Name and function)



① ① LED Operation Indicator
② ② Reference Color Set Button
③ ③ Inspection Tolerance Selector
④ ④ Inspection Mode Selector
⑤ ⑤ Synchronous Mode Selector
⑥ ⑥ Response Timer Selector
⑦ ⑦ OFF-delay Timer Selector

INDICATION FUNCTIONS

① LED Operational Indicator

LED operation indicator illuminates when the output is on.

SWITCH FUNCTIONS

② Reference Color Set Button

This button is used to register a reference color. The reference color can also be registered by an external signal. When this button is pressed or an external signal is inputted, the existing reference color is replaced by a new reference color.

③ Inspection Tolerance Selector

The selector is used to select degree of inspection tolerance which allows for difference from a reference color. The inspection tolerance can be selected in 5 steps. The inspection tolerance is smaller at a small number.

Note: When setting the degree to the positions except 1, 2, 3, 4, and 5, the degree of inspection tolerance becomes 5 automatically.

④ Inspection Mode Seiector

This selector is used to select inspection mode "C" or "C+I".

• Inspection Mode "C"

Since this mode inspects color components (R·G·B color difference) only, the sensor is scarcely influenced by surrounding lights or deflections. This mode is ideal for detecting different kinds of objects.

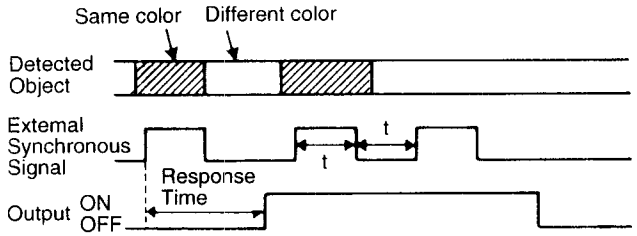
• Inspection Mode "C+I"

Since this mode inspects not only color components but also color brightness, this mode is ideal for inspecting difference of similar colors. In this mode, the sensor is somewhat influenced by surrounding lights and deflections.

⑤ Synchronous Mode Selector

This selector is used to select the external synchronous mode or the internal synchronous mode.

• External Synchronous Mode (EXT)



This mode performs color inspection synchronized witl external signals.

Note 1: The inspection can be performed only when a external synchronous signal rises.

Note 2: An external synchronous signal should last for "t" i response to Response Mode.
F (Fast response): 0.2 msec or more
N (Normal response): 0.5 msec or more
S (Slow response): 3 msec or more

Note 3: Use non-contact signals for an external synchronou signal to prevent chattering.

• Internal Synchronous Mode (INT)

This mode performs color inspection continuously accordin to a repeated response time.

⑥ Response Mode Selector

• Fast Response Mode (F)

This mode is used for high-speed inspection. The respons time is 0.3 msec.

• Normal Response Mode (N)

This mode is used for normal inspection. The response time i 1 msec.

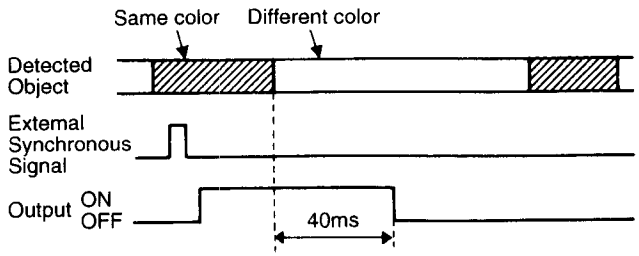
• Slow Response Mode (S)

This mode is used for stable inspection. The response time i 5 msec.

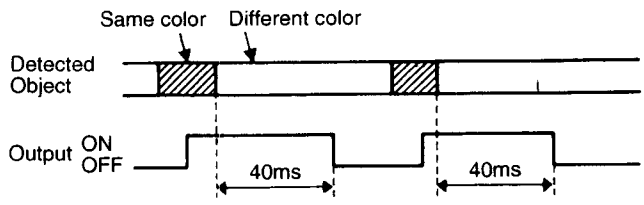
⑦ OFF-delay Timer (T-ON/T-OFF) Selector

This mode is used to select the use of OFF-delay Timer (4 msec). This mode holds the output for 40 msec.

• When external synchronization is used.



• When internal synchronization is used.



REFERENCE COLOR REGISTRATION

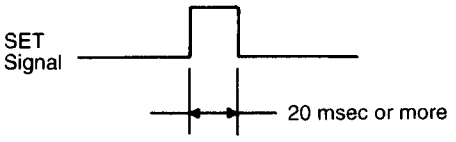
• Basic Operation by Manual Registration

When inspection mode, inspection tolerance, and a reference color are set on the operation panel;

(1) Set the synchronous mode to "INT".
(2) Set the response mode.
(3) Fix the registration color and press the Reference Color Set Button (SET).
(4) Set the inspection tolerance, inspection mode, and off-delay timer.

When inspection mode and inspection tolerance are set on the operation panel and a reference color is registered by an external signal;

(1) Set the synchronous mode to "INT".
(2) Set the response mode.
(3) Fix the registration color and send the input signals to SET input as shown below.



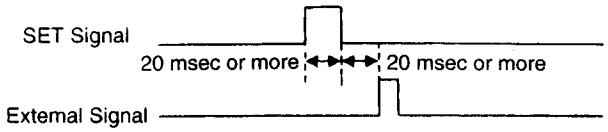
- A pulse of 20 msec or more should be provided to SET input.
- The interval between a SET signal and the next SET signal should be 20 msec or more.

(4) Set the inspection tolerance, inspection mode, and off-delay timer.

• Remote Registration of Reference Color

This method is used for on-line color registration.

(1) Set the synchronous mode to "EXT".
(2) Set the inspection tolerance, inspection mode, response mode, and off-delay timer.
(3) Input signals are transmitted as follows.



- A pulse of 20 msec or more should be provided to SET input.
- The interval between SET signal and External synchronous signal should be 20 msec or more.
- Registration timing can be determined by an external synchronous signal.

Remote registration cannot be performed when FAST mode is selected.

CONNECTING FIBER UNIT TO AMPLIFIER

Push down the fiber lock using the attached screwdriver, insert the fiber unit to the amplifier unit, and then lock the fiber unit by pushing up the fiber lock.

① To remove the fiber unit, push down the fiber lock and pull the fiber unit out.
② For the coaxial fiber unit, connect the ø1-core fiber to the projector (lower) port in the amplifier unit.

Note: Before inserting the fiber unit, wipe off any moisture from the connecting end of the fiber, so as to prevent water entry and subsequent malfunction.

INSTALLING THE AMPLIFIER UNIT

The amplifier unit can be installed to the attached mounting bracket or a 35mm-wide DIN rail easily.

• Installation

① First, insert the front of the amplifier unit onto the DIN rail or attached mounting bracket.
② Second, press down the rear of the amplifier unit onto the DIN rail or attached mounting bracket.
③ Push the latch to the previous position and lock the latch.

Note 1: Make sure the amplifier unit is installed onto the DIN rail before installing the fiber unit to the amplifier unit.
Note 2: Use BNL6P mounting clips on both sides of the amplifier unit to prevent from moving sideways.

• Release

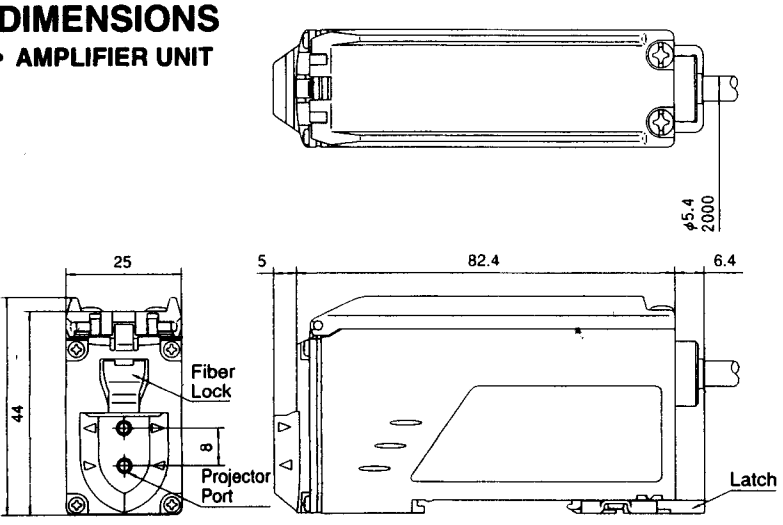
Insert the screwdriver into the hole on the latch and pull the latch toward you to release the amplifier unit.

• Removal

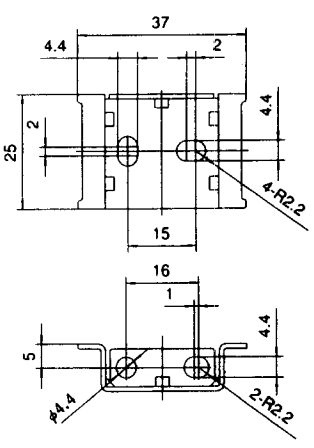
Insert the screwdriver into the hole on the latch and pull the screwdriver toward you.

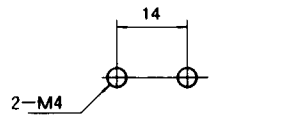
DIMENSIONS

• AMPLIFIER UNIT

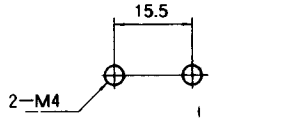


• MOUNTING BRACKET





MOUNTING HOLE LAYOUT (BASE)



MOUNTING HOLE LAYOUT (SIDE)

All dimensions in mm