

Installation and Operating Instructions

Bulletin 42JS VisiSight™ Photoelectric Sensors

SAVE THESE INSTRUCTIONS FOR FUTURE USE.
Refer to the product catalog pages for additional information.

Description

The 42JS VisiSight family of sensors offers a full range of sensing modes in a miniature rectangular housing. Visible light source is offered in all models for ease of alignment. Additional transmitted beam infrared LED source models are offered for superior crosstalk immunity.

The 42JS VisiSight family provides an indication if the sensor operation is unstable. An indicator flashes if the signal level is too close to the detection threshold. This helps in easy alignment of the sensor and forewarns against detection of a background.

Features

- Visible light source offered on all models for ease of alignment
- Optional snap-on adaptor for 18 mm mounting
- Patented ASIC design offers linear sensitivity adjustment, stability indication, and excellent noise immunity
- Compact sealed housing and cavity-free design to minimize collection of dust and debris while allowing for easy sensor cleanup
- Threaded metal M12 or M8 connector on pigtail
- 360° visible LED status indicators
- Additional transmitted beam models available with Infrared light source for superior cross talk immunity
- Input to disable light source on transmitted beam emitter

Specifications

Certifications	cULus and CE marked for all applicable directives
Environmental	
Operating Environment	IP67
Operating Temperature [C (F)]	-20...+60° (-4...140°)
Vibration	10...55Hz, 1 mm amplitude; meets or exceeds IEC 60947-5-2
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2
Relative Humidity	5...95% (noncondensing)
Ambient Light Immunity	Incandescent light 5000 Lux

Specifications (continued)

Optical				
	Standard Diffuse	Background Suppression	Polarized Retro	Transmitted Beam
Sensing Range ❶	800 mm (31.5 in.)❷ 250 mm (9.8 in.)❸	6...55 mm (0.24...2.17 in.)❹ 2...130 mm (0.07...5.12 in.)❺	30 mm... 3.5 m (1.18 in... 11.5 ft)	10 m (32.8 ft)
Field of View	4°❶	14°❷	2.8°	4°
	5.5°❸	17°❹		
Spot Size at max. rated range	60 mm (2.36 in.)❷	7.6 mm (0.30 in.) @ 55 mm❹	175 mm (6.89 in.)	700 mm (27.56 in.)
	40 mm (1.57 in.)❸	11.5 mm (0.45 in.) @ 130 mm❺		
Light Source	Visible red (645 nm)			Visible red (645 nm) & Infrared (850 nm)
Sensitivity Adjustments	Single-turn pot.	No adjustment	Single-turn pot. adjustment and no adjustment models	Single-turn pot.

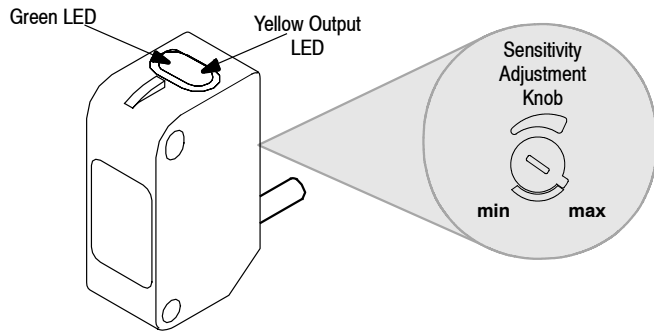
Electrical	
Voltage	10...30V DC
Current Consumption	25 mA
Protection	Short circuit, overload, false pulse, transient noise, reverse polarity

Outputs	
Response Time	1 ms
Output Type	PNP or NPN by cat. no.
Output Mode	Complementary light and dark operate
Output Current	100 mA
Output Leakage Current	10 µA max

Mechanical	
Housing Material	ABS
Lens Material	PMMA
Cover Material	PMMA
Connection Types	2 m (6.5 ft) cable, 4-pin DC micro (M12) QD, 4-pin pico (M8) QD
Supplied Accessories	Mounting hardware (M3x25) stainless steel screws
Optional Accessories	Snap-on adaptor for 18 mm mounting (IP40), mounting brackets, cordsets, reflectors

- ❶ See Typical Response Curves for sensing range with the 18 mm mounting adaptor.
- ❷ For 55 mm background suppression models (42JS-B2MNB1-F4 and 42JS-B2MPB1-F4).
- ❸ For 130 mm background suppression models (42JS-B2MNB2-F4 and 42JS-B2MPB2-F4).
- ❹ For 800 mm diffuse models (42JS-D2MNA1-F4 and 42JS-D2MPA1-F4).
- ❺ For 250 mm diffuse models (42JS-D2MNA2-F4 and 42JS-D2MPA2-F4).

Sensor Indicators

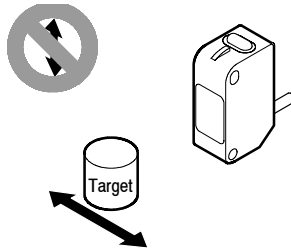


LED Status

Green	OFF	Power is Off
	ON	Power is On
	Flashing (6 Hz)	Unstable ($0.5 < \text{Margin} < 2$)
	Flashing (1.5 Hz)	Output short-circuit protection active
Yellow	OFF	Output de-energized ❶
	ON	Output energized ❶

❶ Black wire or pin 4 of connector.

Background Suppression Sensors



Note: Due to the detection method, targets travelling horizontal to the sensor's optics are detected. Targets travelling vertically may not be accurately detected. For reliable background suppression, a minimum separation distance of 6 mm is recommended between the target and the background.

Sensor Alignment

- Ensure that the sensitivity knob is set at its maximum (factory default) setting.
- Pan the sensor left, right, up, and down to center the beam on the sensed object (for diffuse), reflector (for retroreflective) or transmitter (for transmitted beam). Affix the sensor position when the green LED is ON (not flashing) and the yellow output LED is ON (light sensed and L.O. output energized). This set up assures a good margin and that the signal received is greater than twice the signal required to energize the L.O. output.
- For diffuse applications, remove the object being sensed and observe the green LED. If the green LED is flashing (at 6 Hz), it indicates that the sensor is receiving more than half the signal required to energize the L.O. output when there should be minimal or no received signal. It indicates that the sensor is getting close to detection of the background. Stability may be optimized by reducing the reflectivity of the background or reducing the sensitivity. Reducing the sensitivity shortens the sensing range. If sensitivity is reduced, check that both the green and yellow LEDs are on when the object is detected (step 2 above). In applications where full range is

needed, i.e., sensitivity cannot be reduced, the green LED may be left flashing.

- For retroreflective and transmitted beam applications, place the object to be sensed in the beam path and observe the green LED. If the green LED is flashing (at 6 Hz), it indicates that sensor is receiving more than half the signal required to energize the L.O. output when there should be minimal or no received signal. It indicates that the object being detected is letting some light go through (semi-transparent or too small in size). Adjust sensitivity and repeat step 2.

Crosstalk Avoidance

For applications of transmitted beam sensors requiring adjacent pairs to be mounted in close proximity, use red LED and infrared LED pairs as adjacent pairs.

The following spacing (center to center) between the adjacent pairs should be maintained to avoid crosstalk:

- Red LED pair adjacent to infrared LED pair:
 - 60 mm (2.4 in.) for sensing range up to 1.6 m (4.8 ft)
 - 20 mm (0.8 in.) for sensing range greater than 1.6 m (4.8 ft)
- Two adjacent pairs of red LED models or two adjacent pairs of infrared LED: 360 mm (14 in.)

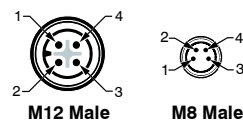
Two pairs of red LED or two pairs of infrared LED can be mounted adjoining each other by transposing the emitter and receiver positions of the second pair vs. the first pair. There is no crosstalk as each receiver only receives signal from one emitter.

Mounting the Sensor

Securely mount the sensor on a firm, stable surface or support. An application which is subject to excessive vibration or shifting may cause intermittent operation. Adaptors and mounting brackets are available for a flexible installation that may include vibration and shock while shifting. See Accessories section for more details.

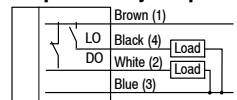
Wiring Diagrams

Cable connection is shown in the following diagrams. Pin numbers correspond to an M12 or M8 male connector on the sensor.

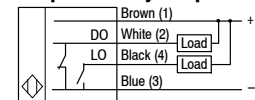


PNP Models with Complementary Outputs

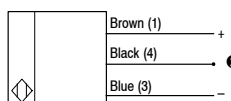
PNP Models with Complementary Outputs



NPN Models with Complementary Outputs



Transmitted Beam Emitter

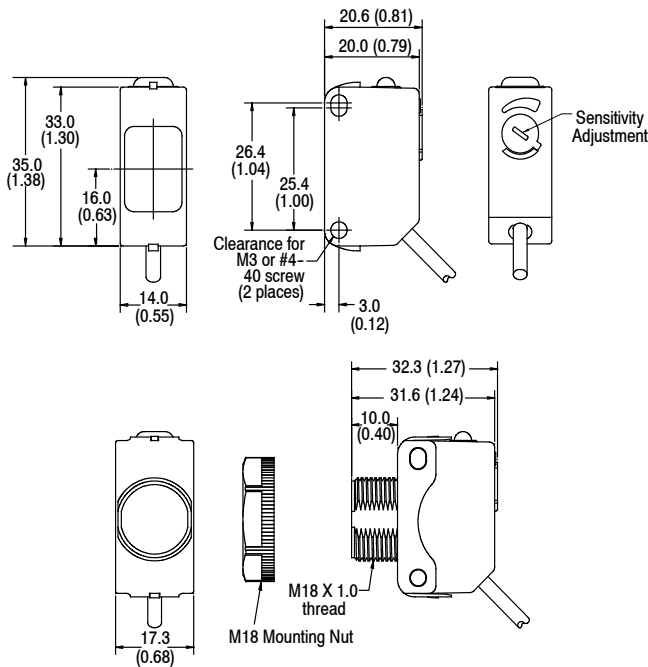


❶ For normal operation, black wire (pin 4) needs no connection. To disable light source, connect black wire (pin 4) to +V.

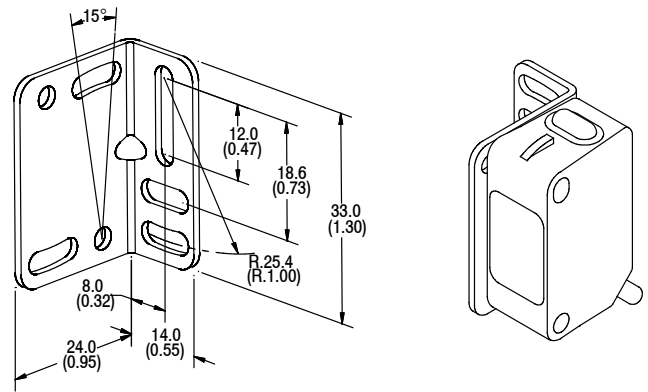
Approximate Dimensions [mm (in.)]

IMPORTANT

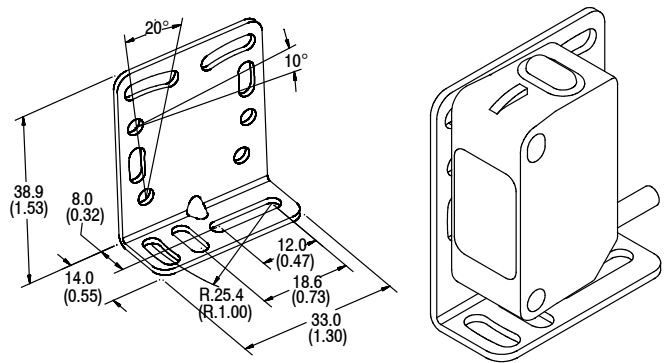
To avoid damage to the sensor or mounting adaptor follow torque specifications.



60-BJS-L1—Mounting Bracket ②



60-BJS-L2—Mounting Bracket ③

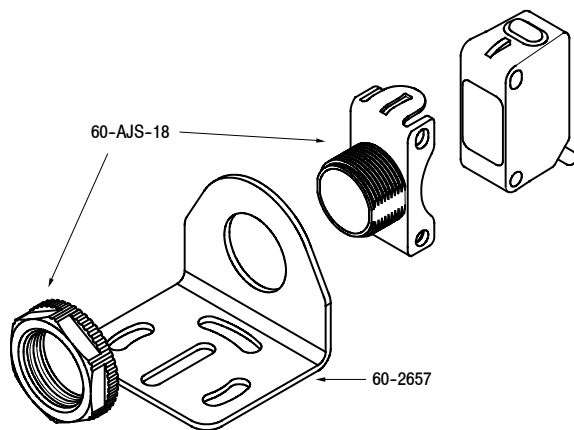


Accessories

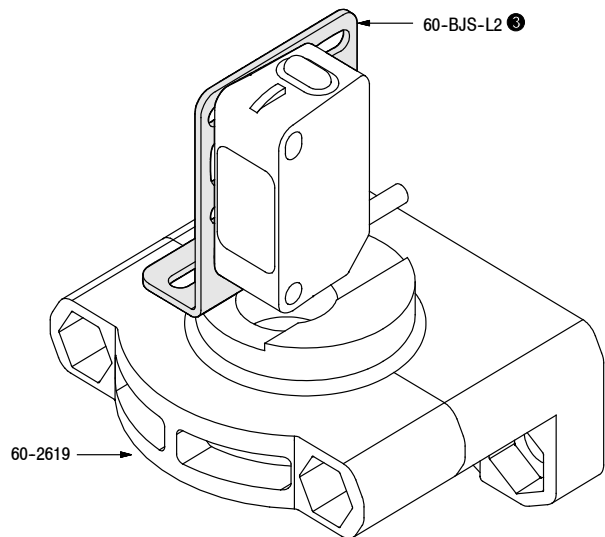
18 mm Snap-On Adaptor ①

The sensor can be mounted using an 18 mm snap-on adaptor (60-AJS-18) as shown below. Line up the slotted hole with the slotted hole on the sensor and snap on.

To remove the sensor from the adaptor, undo the snap by using a flat screwdriver.



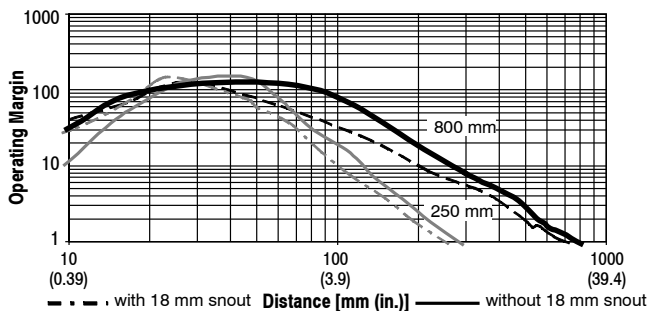
Swivel/Tilt Mounting



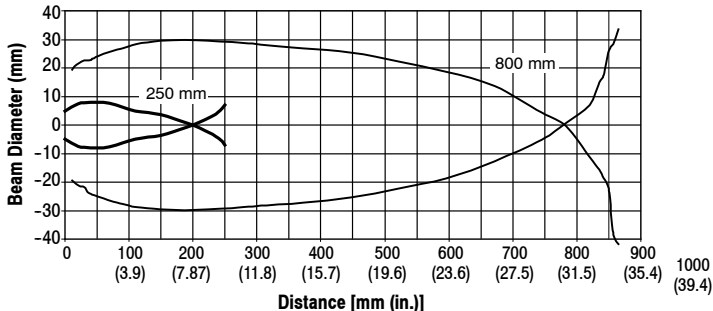
- ① Damage may occur to snap-on adaptor if torque above 15 in•lb is applied to the 18 mm mounting nut.
- ② In high vibration applications, use mounting hardware supplied with the sensor to attach the 18 mm adaptor to the sensor.
- ③ Damage may occur to the sensor housing if torque above 2.5 in•lb is applied to the mounting screws.

Typical Response Curves

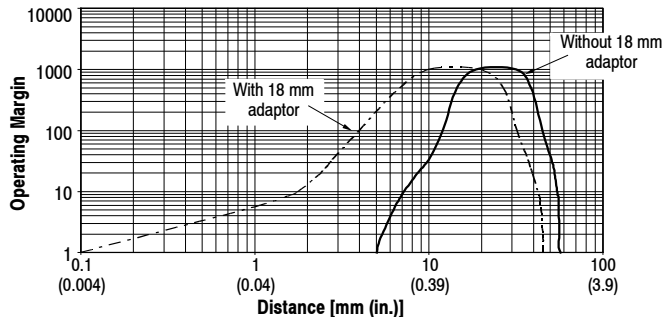
Standard Diffuse



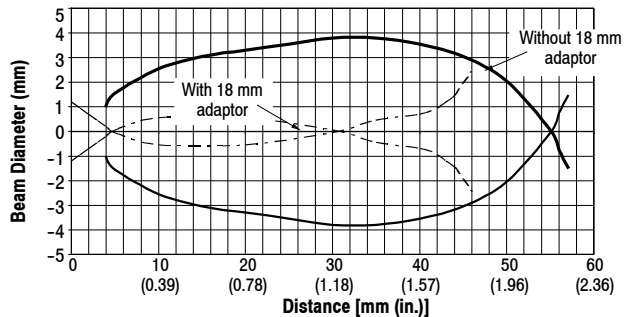
Standard Diffuse—Beam Pattern



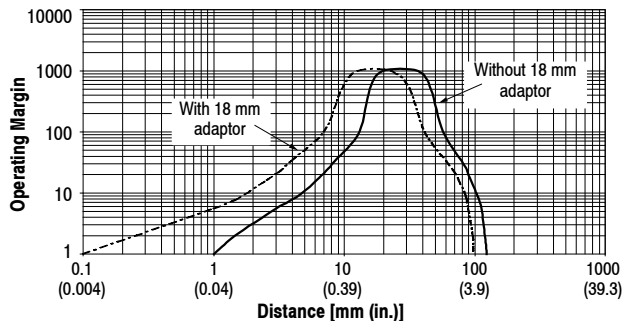
Background Suppression (55 mm)



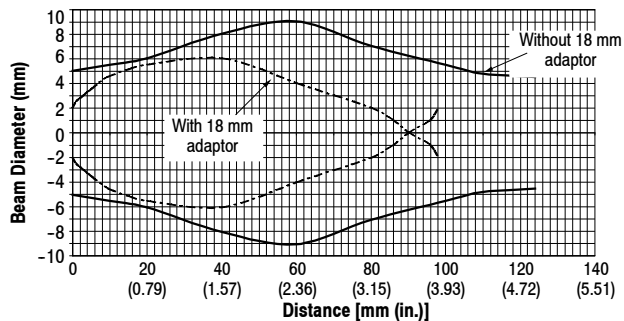
Background Suppression (55 mm)—Beam Pattern



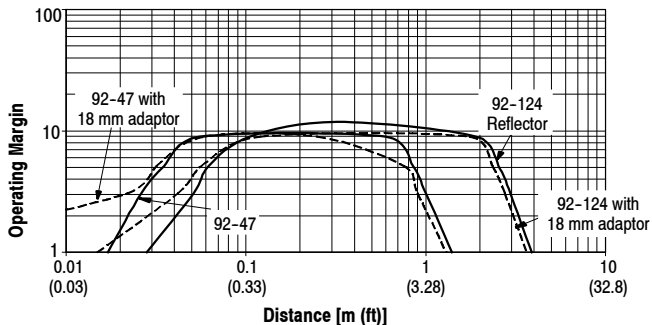
Background Suppression (130 mm)



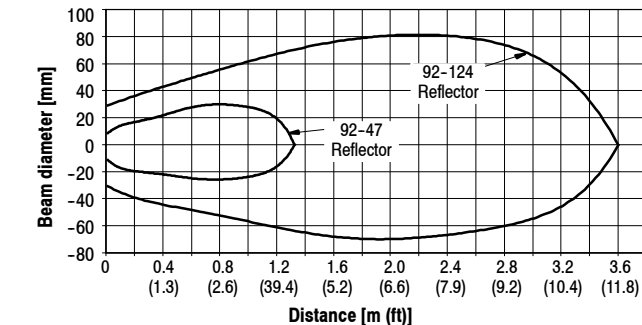
Background Suppression (130 mm)—Beam Pattern



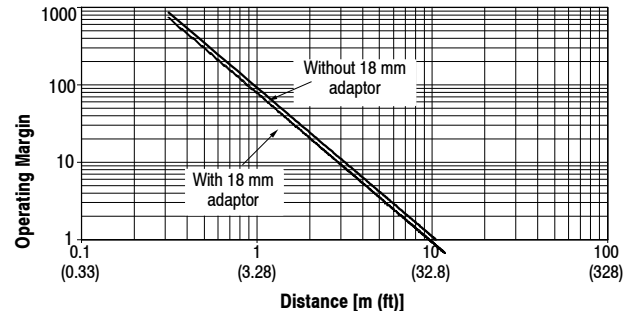
Polarized Retroreflective



Polarized Retroreflective—Beam Pattern



Transmitted Beam—Visible Red and Infrared



Transmitted Beam—Beam Pattern

