Technical Data

Original Instructions

VisiSight Miniature Photoelectric Sensors

Catalog Numbers 42JS-P2MNB1-F4, 42JS-P2MPB1-F4, 42JS-P2MNA2-F4, 42JS-P2MPA2-F4, 42JT-P2LAT1-P4, 42JT-P8LAT1-P4, 42JT-C2LAT1-P4, 42JS-D2MNA2-F4, 42JS-D2MPA2-F4, 42JS-D2MNA1-F4, 42JS-D2MPA1-F4, 42JT-D2LAT1-P4, 42JT-D8LAT1-P4, 42JS-B2MNB1-F4, 42JS-B2MPB1-F4, 42JS-B2MNB2-F4, 42JS-B2MPB2-F4, 42JT-B2LAT1-P4, 42JT-B2LAT2-P4, 42JT-B8LAT1-P4, 42JT-F5LET1-P4, 42JS-E2EZB1-F4, 42JS-R9MNA1-F4, 42JS-R9MPA1-F4, 42JS-E1EZB1-F4, 42JS-R9MNA2-F4, 42JS-R9MPA2-F4, 42JT-E2EZB1-P4, 42JT-R9LAT1-P4, 42JT-E8EZB1-P4, 42JT-R8LAT1-P4

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Add UKCA Marked certification to Specifications tables	3 and 7
Updated sensing distance for 42JT-B2LAT2-P4	8

Features


42JS

42JS Adapter

42JS VisiSight™ sensors include the following features:

- Visible red light-emitting diode (LED) for ease of alignment
- Complementary light and dark operate outputs
- Linear sensitivity adjustment knob or no adjustment models
- Optional snap-on adaptor enables 18 mm mount and facilitates easy sensor replacement
- IP67 rated enclosure

Available Models

- Polarized retroreflective
- Standard diffuse
- Fixed background suppression
- Transmitted beam

Specifications

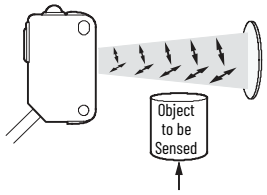
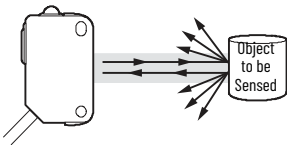
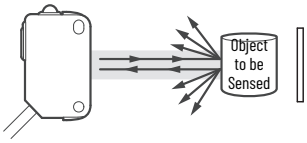
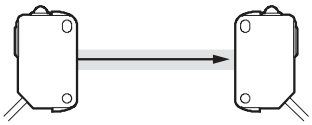
Attribute	42JS VisiSight Sensor
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2
Vibration	10...55 Hz, 1 mm (0.04 in.) amplitude, meets or exceeds IEC 60947-5-2
Environmental	
Enclosure type rating	IP67
Operating temperature	-20...+60 °C (-4...+140 °F)
Relative humidity	5...95% (noncondensing)
Ambient light immunity	Incandescent light 5000 lux
User Interface	
Status Indicator	See User Interface on page 4
Sensitivity adjustment	No adjustment or adjustment knob by cat. no.
Electrical	
Operating voltage	10...30V DC
Current consumption	25 mA max
Protection type	Short circuit, reverse polarity, false pulse, overload
Outputs	
Output type	See Product Selection on page 4.
Output function	Complementary light and dark operate
Load current	100 mA max
Mechanical	
Material	• Housing: Plastic – ABS • Lens: Plastic – PMMA
Connection type	See Product Selection on page 4.

Optical Response Time Characteristics

Attribute	[mm (in.)]			
	Polarized Retroreflective	Diffuse	Background Suppression	Transmitted Beam
Field of view	2.8°	5.5° for 250 (9.8) 4° for 800 (31.5)	14° for 55 (2.16) 17° for 130 (5.12)	4°
Spot size (1)	175 (6.89) @ 3.5 m (11.5 ft)	40 (1.57) @ 250 (9.8) 60 (2.36) @ 800 (31.5)	7.6 (0.3) @ 55 (2.16) 11.5 (0.45) @ 130 (5.12)	700 (27.56) @ 10 m (32.8 ft)
Light source	Visible red			Visible red and infrared
Response time	1 ms			

(1) For more information on spot size, see Typical Response Curves on page 5.

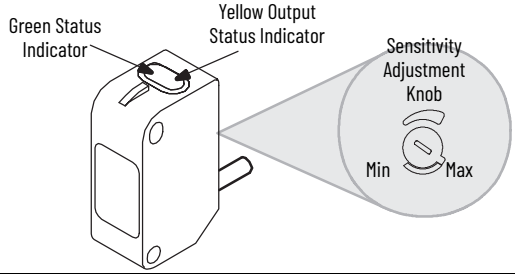
Product Selection

Sensing Mode	Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No.(1)
 Polarized Retroreflective	Visible red 645 nm	0.025...3.5 m (0.08...11.5 ft) (2)	No adjustment	Complementary light and dark operate	NPN	42JS-P2MNB1-F4
					PNP	42JS-P2MPB1-F4
			Adjustment knob		NPN	42JS-P2MNA2-F4
					PNP	42JS-P2MPA2-F4
 Diffuse		3...250 mm (0.12...9.84 in.)	Adjustment knob	Complementary light and dark operate	NPN	42JS-D2MNA2-F4
					PNP	42JS-D2MPA2-F4
		3...800 mm (0.12...31.5 in.)			NPN	42JS-D2MNA1-F4
					PNP	42JS-D2MPA1-F4
 Background Suppression		6...55 mm (0.24...2.17 in.)	No adjustment	Complementary light and dark operate	NPN	42JS-B2MNB1-F4
					PNP	42JS-B2MPB1-F4
		2...130 mm (0.07...5.12 in.)			NPN	42JS-B2MNB2-F4
					PNP	42JS-B2MPB2-F4
 Transmitted Beam (emitter and receiver sold separately)		10 m (32.8 ft)	No adjustment	— (Emitter)	—	42JS-E2EZB1-F4
			Adjustment knob	Complementary light and dark operate	NPN	42JS-R9MNA1-F4
					PNP	42JS-R9MPA1-F4
	Visible red and Infrared 645 nm		No adjustment	— (Emitter)	—	42JS-E1EZB1-F4
			Adjustment knob	Complementary light and dark operate	NPN	42JS-R9MNA2-F4
					PNP	42JS-R9MPA2-F4
Recommended DC micro (M12) quick-disconnect cordset, straight, 4-pin, 2 m (6.6 ft)						889D-F4AC-2
Recommended DC pico (M8) quick-disconnect cordset, straight, 4-pin, 2 m (6.6 ft)						889D-F4AB-2

(1) The -F4 suffix describes a 4-pin DC micro (M12) QD connector on a 150 mm (6 in.) pigtail. For additional connection options, replace the -F4 suffix with -A2 for a 2 m (6.6 ft) cable without QD connection (for example, 42JS-P2MPB1-A2), or -Y4 for a 4-pin DC pico (M8) QD connection on a 150 mm (6 in.) pigtail (for example, 42JS-P2MPB1-Y4).
(2) Sensing distance with 92-124 reflector.

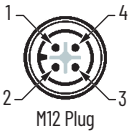
User Interface

Table 1 - Sensor Indicators

	Status Indicator Color	State	Status
	Yellow	Off	Output is deactivated (1)
		On	Output is activated (1)
	Green	Off	Power is off
		On	Power is on
		Flashing (6 Hz)	Unstable (0.5 < Margin < 2)
		Flashing (1.5 Hz)	Output short-circuit protection active

(1) Black wire or pin 4 of the connector.

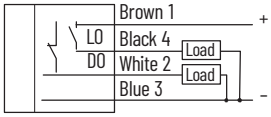
Wiring Diagrams



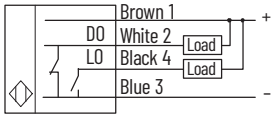
M12 Plug

M8 Plug

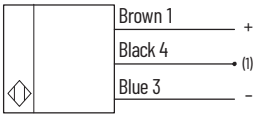
PNP models with complementary outputs



NPN models with complementary outputs

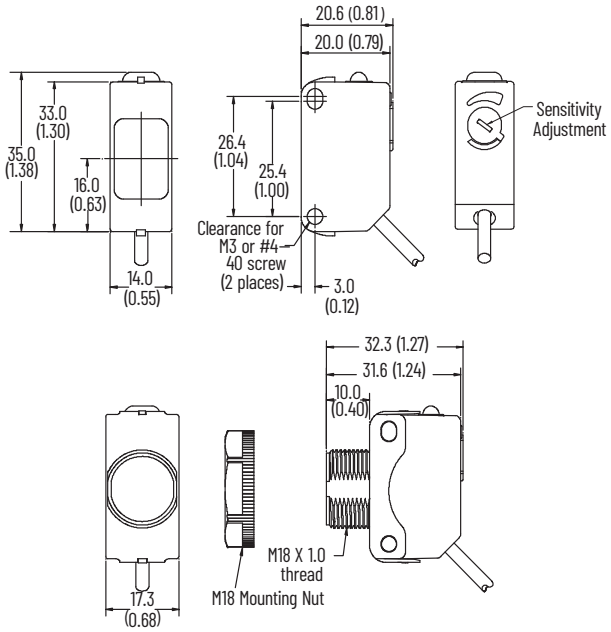


Transmitted beam emitter



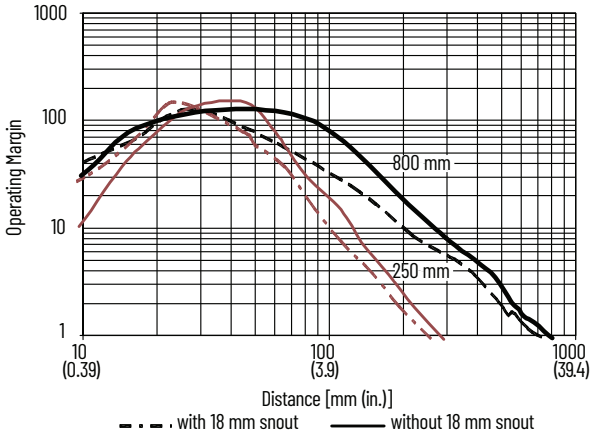
(1) For normal operation, black wire (pin 4) needs no connection. To disable the light source, connect the black wire (pin 4) to +V.

Approximate Dimensions

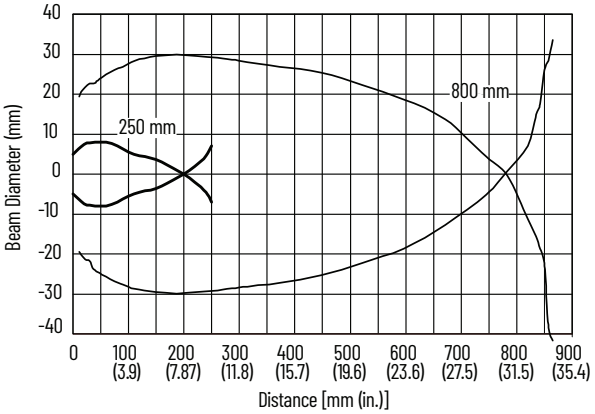


Typical Response Curves

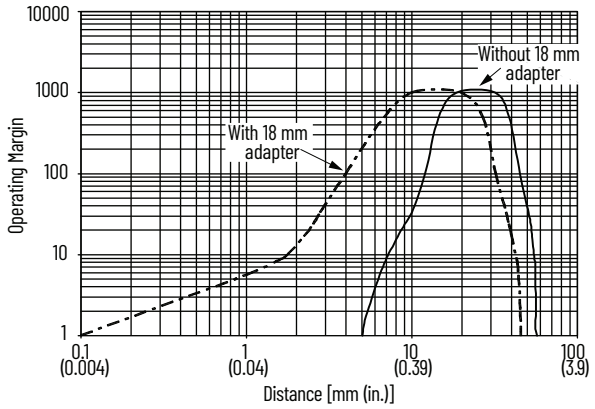
Standard Diffuse



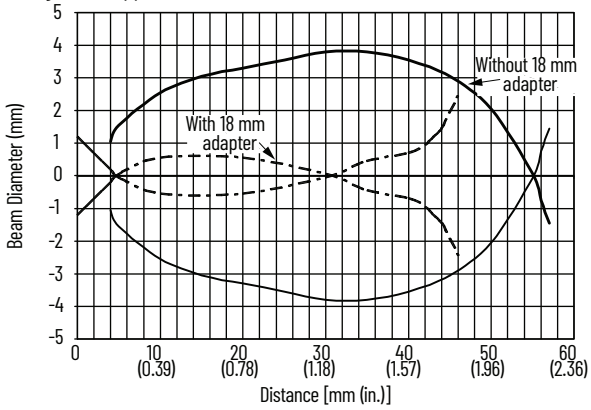
Standard Diffuse—Beam Pattern



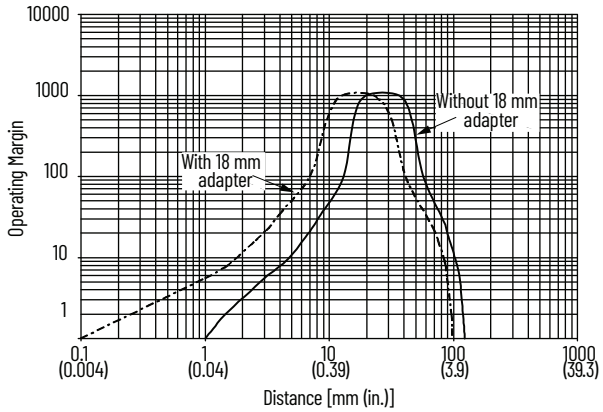
Background Suppression (55 mm)



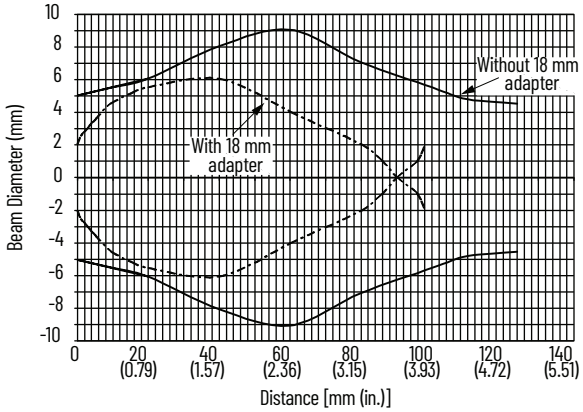
Background Suppression (55 mm)—Beam Pattern



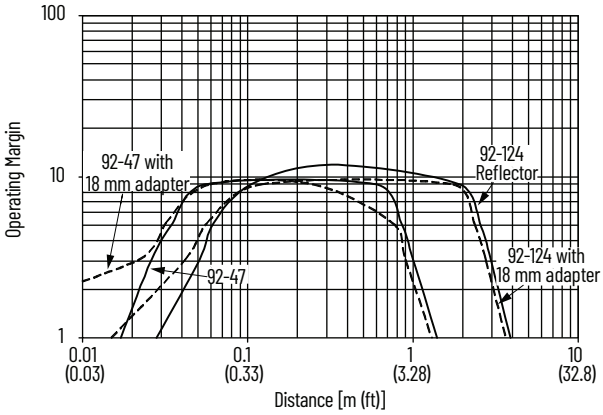
Background Suppression (130 mm)



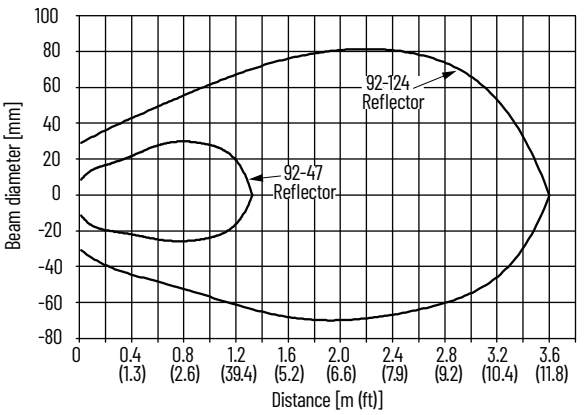
Background Suppression (130 mm)—Beam Pattern



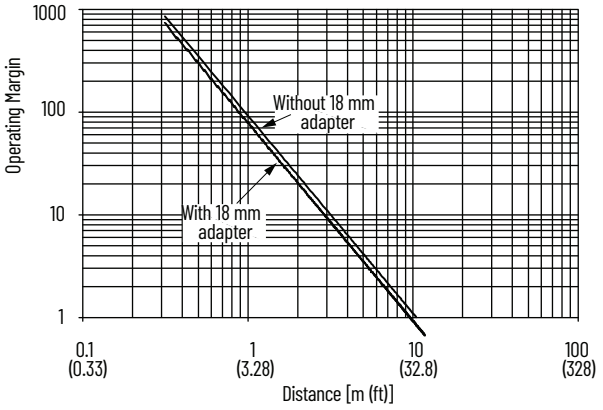
Polarized Retroreflective



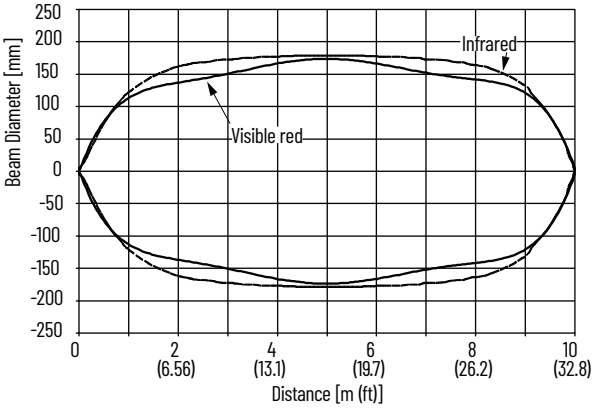
Polarized Retroreflective—Beam Pattern



Transmitted Beam—Visible Red and Infrared



Transmitted Beam—Beam Pattern



Features

42JT VisiSight™ sensors include the following features:

- Class 1 eye-safe red laser beam (for small object and contrast detection) and visible light-emitting diode (LED) models
- Unique auto PNP/NPN output reduces stocking cost and simplifies selection, installation, and maintenance
- Teach push button for sensitivity and L.O./D.O. selection
- IP69K enclosure rating and ECOLAB tested to withstand food industry cleaning chemicals
- Laser etched markings for durability

Available Models

- Polarized retroreflective
- Standard diffuse
- Adjustable background suppression
- Transmitted beam
- Clear object
- Color mark

Specifications

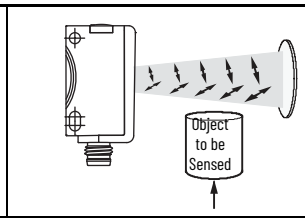
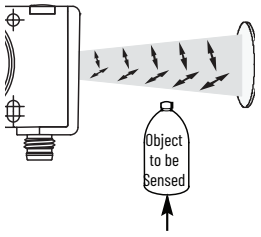
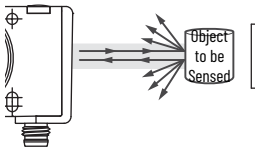
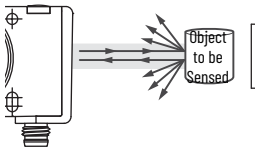
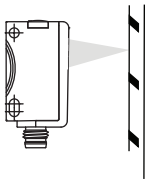
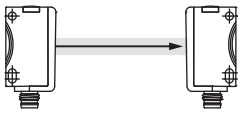
Attribute	42JT VisiSight Sensor
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2
Vibration	10…55 Hz, 1 mm (0.04 in.) amplitude, meets or exceeds IEC 60947-5-2
Environmental	
Enclosure type rating	IP67 and IP69K
Operating temperature	-20…+60 °C (-4…+140 °F)
Relative humidity	5…95% (noncondensing)
Ambient light immunity	Incandescent light 5000 lux
User Interface	
Status indicators	See User Interface on page 9
Sensitivity adjustment	Teach button
Electrical	
Operating voltage	10…30V DC
Current consumption	30 mA max
Protection type	Short circuit, reverse polarity, false pulse, overload
Outputs	
Output type	See Product Selection on page 8.
Output function	Teachable light or dark operate
Load current	100 mA max
Mechanical	
Material	• Housing: Plastic – ABS • Lens: Plastic – PMMA
Connection type	See Product Selection on page 8.

Optical Response Time Characteristics

Attribute	[mm (in.)]					
	Polarized Retroreflective	Clear Object Detection	Diffuse	Background Suppression	Color Mark	Transmitted Beam
Visible Red 660 nm (except for Color Mark Models)						
Spot size(1)	500 (19.7) @ 6 m (236.22 ft)	40 (1.57) @ 1 m (3.28 ft)	70 (2.75) @ 800 (31.5)	15 (0.59) @ 180 (7.09) 27 (1.06) @ 400 (15.75)	1 x 4 (0.16) @ 12 (0.47) (white LED)	1.1 m (3.61 ft) @ 13 m (42.65 ft)
Response time	0.5 ms	0.5 ms	0.5 ms	0.5 ms	50 µs	0.5 ms
Class 1 Laser 650 nm						
Spot size(1)	14 (0.55) @ 13 m (42.65 ft)	–	0.6 (0.02) @ 250 (9.84)	1.3 (0.05) @ 120 (4.72)	–	13 (0.51) @ 18 m (59.05 ft)
Response time	0.25 ms	–	0.333 ms	0.5 ms	–	0.25 ms

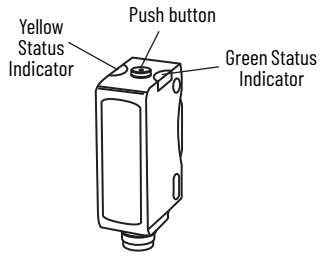
(1) For more information on spot size, refer to Figure on page 10.

Product Selection

Sensing Mode		Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No.(1)
Polarized Retroreflective		Visible red 660 nm	0.1...6 m (0.33...19.7 ft) (2)	Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-P2LAT1-P4
		Class 1 laser	0.05...13 m (0.16...42.7 ft) (3)				42JT-P8LAT1-P4
Clear Object Detection		Visible red 660 nm	2 m (6.6 ft) (3)	Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-C2LAT1-P4
Diffuse		Visible red 660 nm	3...800 mm (0.12... 31.5 in.)	Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-D2LAT1-P4
		Class 1 laser	5...250 mm (0.20... 9.84 in.)				42JT-D8LAT1-P4
Background Suppression		Visible red 660 nm	1...180 mm (0.4...7.1 in.)	Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-B2LAT1-P4
			3...400 mm (0.12... 15.75 in.)				42JT-B2LAT2-P4
		Class 1 laser	4...120 mm (0.16...4.72 in.)				42JT-B8LAT1-P4
Color Mark		White LED 400... 780 nm	12 ± 2.5 mm (0.47 ± 0.98 in.)	Teach button	Teachable light or dark operate	PNP or NPN (push pull)	42JT-F5LET1-P4
Transmitted Beam (emitter and receiver sold separately)		Visible red 660 nm	13 m (42.65 ft)	No adjustment	— (Emitter)	—	42JT-E2EZB1-P4
				Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-R9LAT1-P4
		Class 1 laser	18 m (59.05 ft)	No adjustment	— (Emitter)	—	42JT-E8EZB1-P4
				Teach button	Teachable light or dark operate	Auto PNP or NPN	42JT-R8LAT1-P4
Recommended DC micro (M12) quick-disconnect cordset, straight, 4-pin, 2 m (6.6 ft)							889D-F4AC-2
Recommended DC pico (M8) quick-disconnect cordset, straight, 4-pin, 2 m (6.6 ft)							889P-F4AB-2

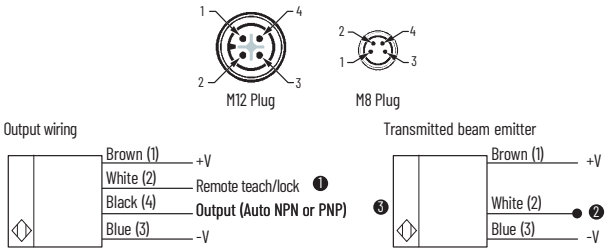
(1) The -P4 suffix describes a 4-pin DC pico (M8) integral QD connector. For additional connection options, replace the -P4 suffix with -A2 for a 2 m (6.6 ft) cable without QD connection (for example, 42JT-P2LAT1-A2) or -F4 for a 4-pin DC micro (M12) QD connection on a 150 mm (6 in.) pigtail (for example, 42JT-P2LAT1-F4).
(2) Sensing distance with 92-125 reflector.
(3) Sensing distance with 92-118 reflector.

User Interface

Sensor	Status Indicator Color	State	Status
	Yellow (1)	Off	Output is deactivated
		On	Output is activated
	Green	Off	Power is off
		On	Power is on
		Flashing (6 Hz)	Unstable (0.5 < Margin < 2)
		Flashing (1.5 Hz)	Output short-circuit protection active

(1) Except for color mark sensors—color mark sensors have PNP or NPN (push-pull) output. This table shows the status indication when output is connected as PNP. If connected as NPN, the yellow status indicator is ON when the output is deactivated and OFF when it is activated.

Wiring Diagrams



❶ Normal operation: no connection.
Remote teach: See 42JT Remote Teach section.
Push button lock: connect to a -V. See the 42JT Push Button Lock/Unlock section.

❷ For Normal operation, white wire (pin 2) needs no connection. To disable light source, connect white wire (pin 2) to +V.

❸ Output is PNP or NPN (push-pull) for color mark sensors.

42JT Push Button Lock/Unlock

The push button or remote teach can be used to help prevent unauthorized users from changing teach settings.

To lock the push button, press and release the button three times within 3 seconds. Both status indicators flash synchronously for 3 seconds, which indicates that the push button is now locked.

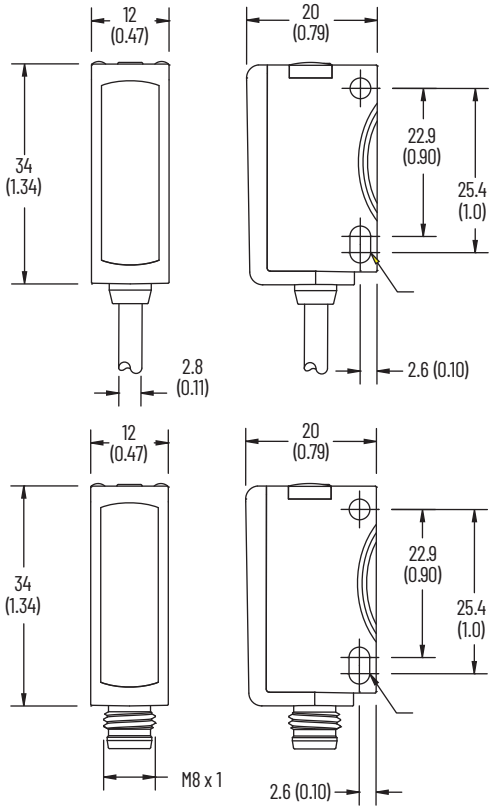
To unlock the push button, press and release the button three times within 3 seconds. Both status indicators flash asynchronously for 3 seconds, which indicates that the push button is now unlocked.

To lock the push button permanently, connect the white wire (pin 2) to -V.

42JT Remote Teach

The sensor can be taught remotely via the white wire (pin 2). Connection to +V acts the same as the button being pressed and no connection is the same as the button not being pressed. The sensor can be taught by following the same teach/timing sequence as used in the push button teach (for example, connect to the +V for more than 3 seconds to teach the target, disconnect from the +V; remove the target and connect to the +V for less than 1 second to teach the no target condition). All push button functions can also be conducted via remote teach.

Approximate Dimensions

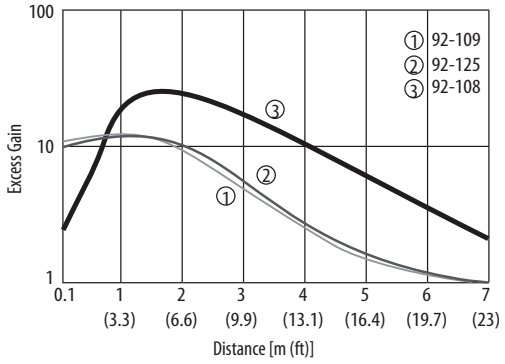


The 42JT mounting holes are located toward the rear end of the sensor while the 42JS mounting holes are located toward the front. Both sensors are compatible with the industry standard 25.4 mm (1 in.) mounting. The 42JT flexible mounting hole space range of 22.9...25.4 mm (0.9...1 in.) makes it compatible with the 24.1 mm (0.95 in.) hole space sensors.

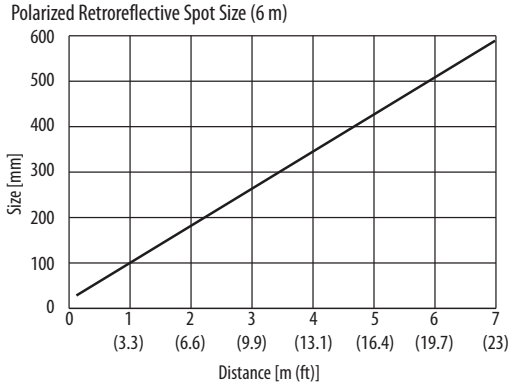
See rok.auto/systemtools for two-dimensional and three-dimensional CAD drawings.

Typical Response Curves

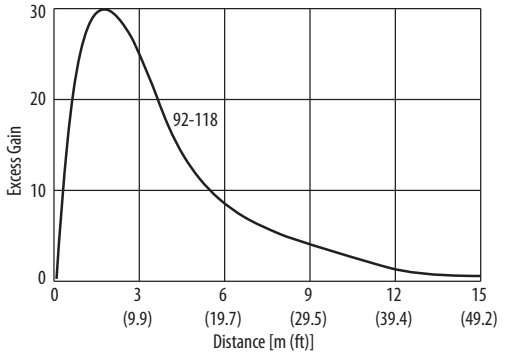
Red Polarized Retroreflective (6 m)



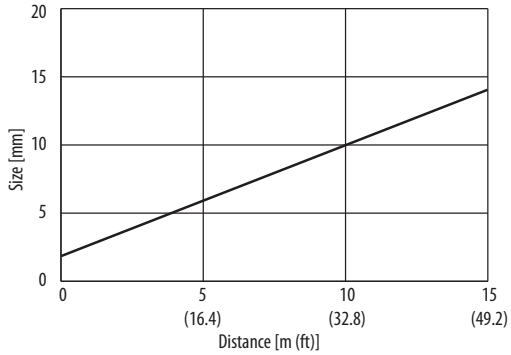
Polarized Retroreflective Spot Size (6 m)



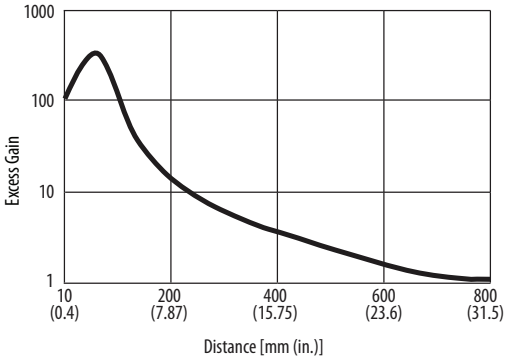
Laser Polarized Retroreflective — Margin Curve (13 m)



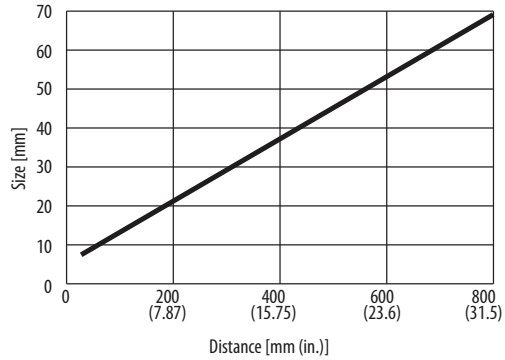
Laser Polarized Retroreflective Spot Size (13 m)



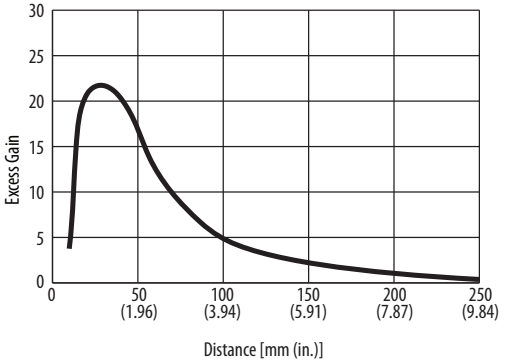
Standard Diffuse (800 mm)



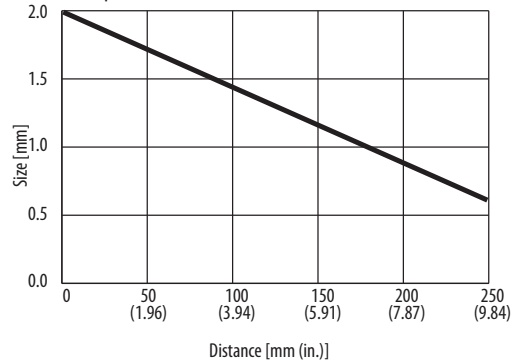
Diffuse Spot Size (800 mm)



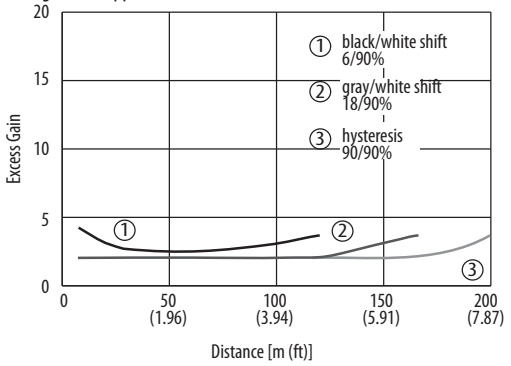
Laser Diffuse (250 mm)



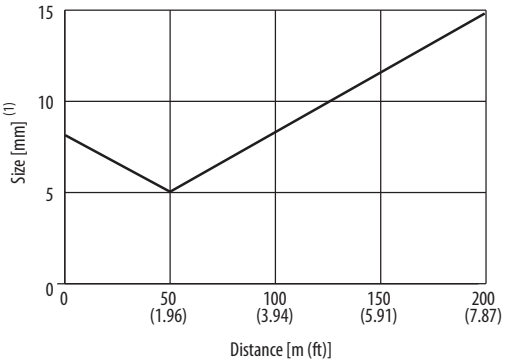
Laser Diffuse Spot Size (250 mm)



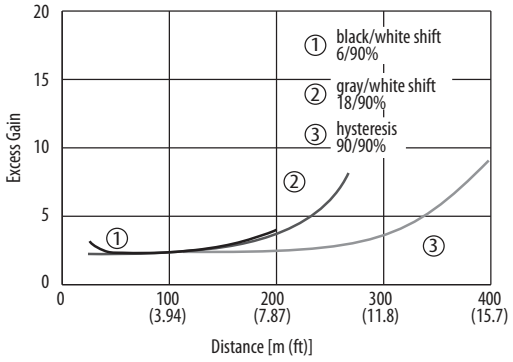
Background Suppression (180 mm)



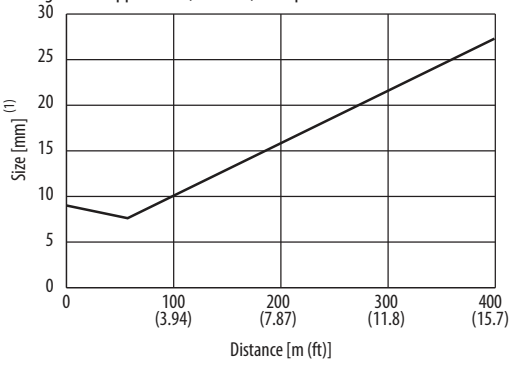
Background Suppression (180 mm) — Spot Size



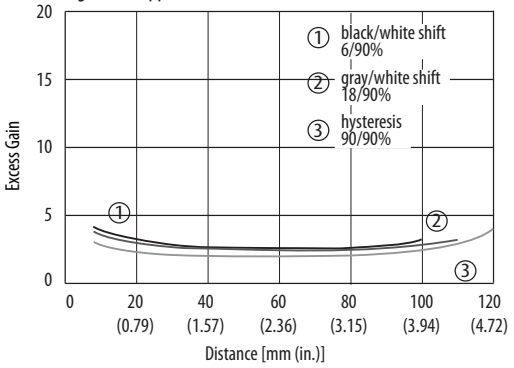
Background Suppression (400 mm)



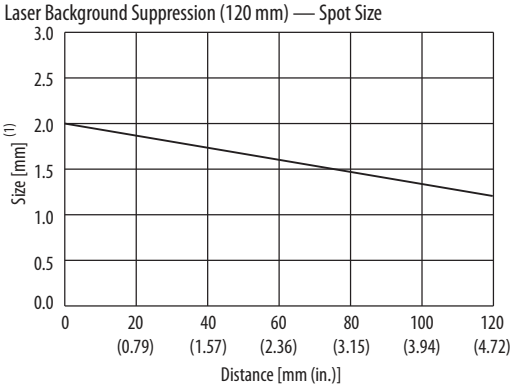
Background Suppression (400 mm) — Spot Size



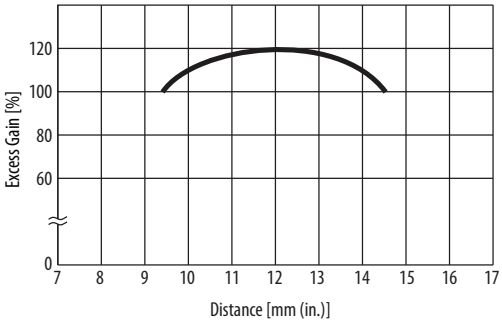
Laser Background Suppression (120 mm)



Laser Background Suppression (120 mm) — Spot Size

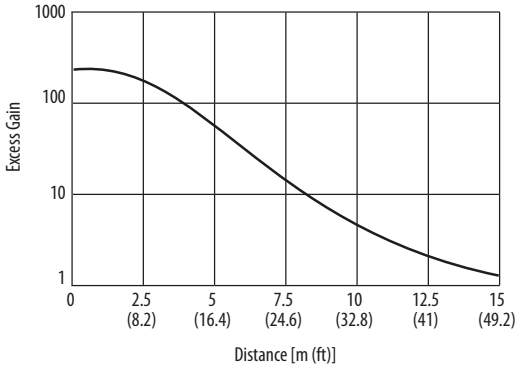


Color Mark

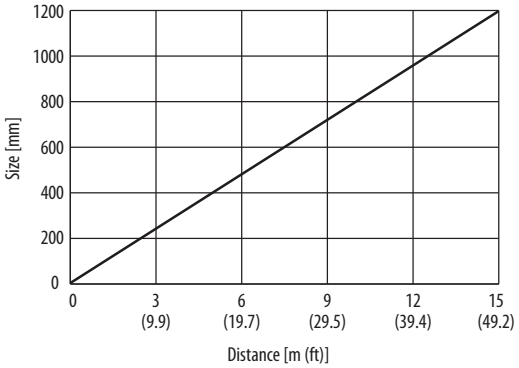


(1) The spot is square in shape with one side dimension per graph.

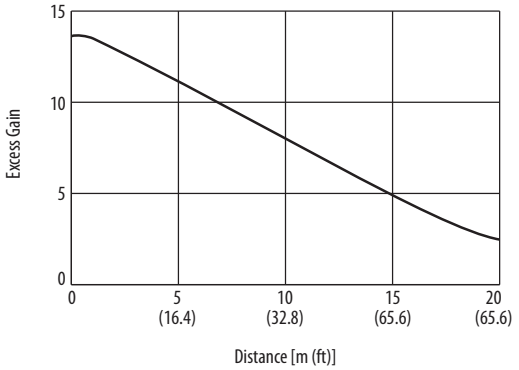
Red Transmitted Beam (13 m)



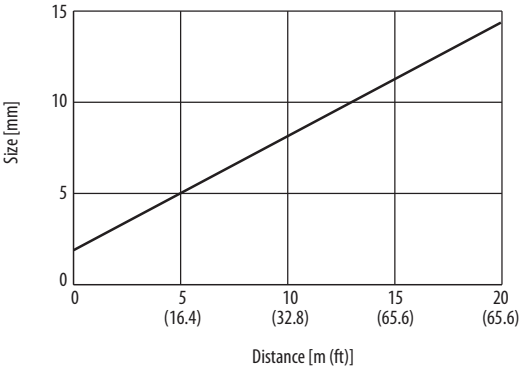
Red Transmitted Beam (13 m) — Spot Size



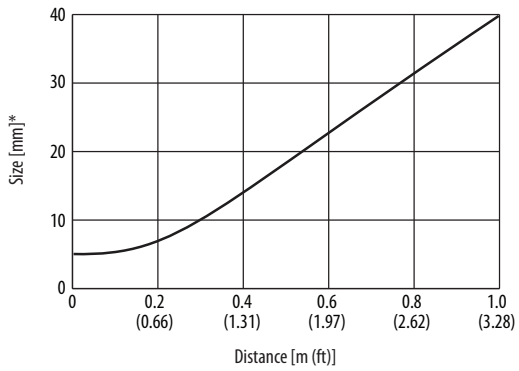
Laser Transmitted Beam (18 m)



Laser Transmitted Beam (18 m) — Spot Size



Clear Object Spot Size



Accessories

Description		Cat. No.
DC micro (M12) QD cordset, straight, 4-pin, 2 m (6.6 ft)		889D-F4AC-2
DC pico (M8) QD cordset, straight, 4-pin, 2 m (6.6 ft)		889P-F4AB-2
DC pico (M8) QD cordset, right angle, 4-pin, 2 m (6.6 ft)		889P-R4AB-2
Mounting bracket	Stainless steel, L-shaped for 42JT and 42JS	60-BJS-L1
	Stainless steel, L-shaped for 42JS VisiSight	60-BJS-L2
	Stainless steel	60-BKTL-SS
	Stainless steel, L-shaped for 42JT and 42JS VisiSight	60-BJT-L2
	Plastic, swivel/tilt for 42JS VisiSight	60-2619
	Replacement, stainless steel, for replacing larger (50 x 50 mm) sensors	60-BJT-RCS
	Protective, stainless steel, U-shaped for 42JT and 42JS	60-BJT-U1
	Protective, stainless steel, horizontal and vertical for 42JT and 42JS VisiSight	60-BJT-H1

Description		Cat. No.
Reflector	Corner cube, 76 mm (3 in.) diameter	92-124
	Corner cube, 84 mm (3.3 in.) diameter	92-125
	Corner cube, 32 mm (1.5 in.) diameter	92-47
	Corner cube, 100 x 100 mm (4 x 4 in.)	92-108
	Corner cube, 51 x 61 mm (2 x 2.5 in.)	92-109
	Micro cube, 51 x 61 mm (2 x 2.5 in.) for laser and clear object models	92-118

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
VisiSight Photoelectric Sensors Installation Instructions, publication 42JS-IN001	Provides information to install and operate 42JS VisiSight photoelectric sensors.
Series 7000 to 42JS VisiSight Replacement Kit Installation Instructions, publication 42JS-IN002	Provides information on the kits that are designed to facilitate the transition of the Series 7000 photoelectric sensors to the 42JS VisiSight product family.
42JS VisiSight Photoelectric Sensors Installation Instructions, publication 42JS-IN003	Provides information to install and operate 42JS VisiSight photoelectric sensors.
42JT VisiSight Photoelectric Diffuse Sensors with IO-Link Installation Instructions, publication 42JT-IN001	Provides information to install and operate 42JT VisiSight diffuse photoelectric sensors.
42JT VisiSight Photoelectric Polarized Retroreflective Sensors with IO-Link Installation Instructions, publication 42JT-IN002	Provides information to install and operate 42JT VisiSight polarized retroreflective photoelectric sensors.
42JT VisiSight Photoelectric Transmitted Beam Sensors with IO-Link Installation Instructions, publication 42JT-IN003	Provides information to install and operate 42JT VisiSight transmitted beam photoelectric sensors.
VisiSight Photoelectric Background Suppression Sensors with IO-Link Installation Instructions, publication 42JT-IN004	Provides information to install and operate VisiSight background suppression photoelectric sensors with IO-Link.
42JT VisiSight Photoelectric Color Mark Sensors with IO-Link Installation Instructions, publication 42JT-IN005	Provides information to install and operate 42JT VisiSight color mark photoelectric sensors.
42JT VisiSight Photoelectric Clear Object Sensors with IO-Link Installation Instructions, publication 42JT-IN006	Provides information to install and operate 42JT VisiSight clear object photoelectric sensors.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
ProposalWorks™ configuration software, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608, FAX: (65) 6510 6699
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

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