

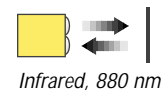


# MINI-BEAM<sup>®</sup> SM312W and SM312DBZ

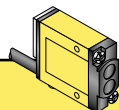
Self-contained DC-operated Wide-angle Diffuse Mode Proximity Sensors



- Compact, modulated, self-contained infrared wide-angle diffuse proximity mode sensors for 10-30V dc operation
- SM312W wide angle (divergent) diffuse mode sensor, 125 mm (5 in) range; Ideal for close-range sensing of transparent or translucent objects, or objects with small profile
- SM312DBZ: wide-angle diffuse mode sensor, 300 mm (12 in) range
- Both models have clear acrylic opto-element covers to meet FDA food-processing application requirements
- Switch-selectable for light operate or dark operate
- Includes Banner's exclusive **AID™** alignment system\*
- Highly-repeatable 1 millisecond response
- Both sourcing and sinking outputs (150 mA max. each); continuous overload and short-circuit protected
- Rugged, epoxy-encapsulated construction: meets NEMA standards 1, 2, 3, 3S, 4, 4X, 6, 12 and 13; IEC IP67



\*US patent number 4356393



## MINI-BEAM Diffuse Mode Models

Models	Range	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Performance based on 90% reflectance white test card	
SM312DBZ SM312DBZQD	300 mm (12")	2 m (6.5') 4-Pin Euro QD	10-30V dc	Bipolar NPN/PNP		
SM312W SM312WQD	130 mm (5")	2 m (6.5') 4-Pin Euro QD	10-30V dc	Bipolar NPN/PNP		

**\*NOTES:**

- 9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., SM312DBZ W/30).
- A 150 mm (6") long pigtail cable with attached QD connector is available by adding suffix "QDP" to the model number of any MINI-BEAM sensor (e.g., SM312DBZQDP). See page 5 for more information.
- A model with a QD connector requires an accessory mating cable. See page 6 for more information.
- May be ordered with 0.3 millisecond on/off response by adding suffix "MHS" to the model numbers (e.g., SM312DBZMHS). This modification reduces sensing range (and excess gain).

## MINI-BEAM Installation and Alignment

Proper operation of a SM312W or SM312DBZ sensor requires that it be mounted securely and aligned properly. The wide-angle optics of these sensors makes sensor alignment very forgiving.

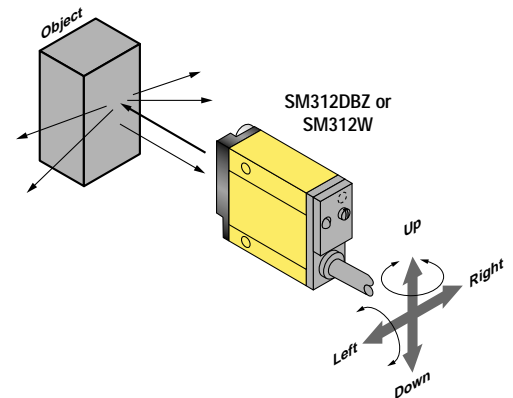
- 1) Begin with the sensor at the desired distance from the object to be sensed, and at the approximate position where it will be mounted. Any background should be as far behind the object as possible (at least three times the sensor-to-object distance), and as dark a color as possible, compared to the object. Ideally, the object should present its largest reflective surface to the sensor.
- 2) Apply power to the sensor, and advance the 15-turn GAIN control to maximum (clockwise end of rotation). The GAIN control is clutched at both ends to avoid damage, and will “free-wheel” when either end point is reached.

If the sensor is “seeing” its reflected light, the sensor alignment LED should be “on”. Move the sensor up-down-right-left (include angular rotation) to obtain the fastest receiver LED pulse rate. If a pulse is not observable (too fast to count), reduce the GAIN control (counterclockwise rotation) to obtain a countable pulse rate.

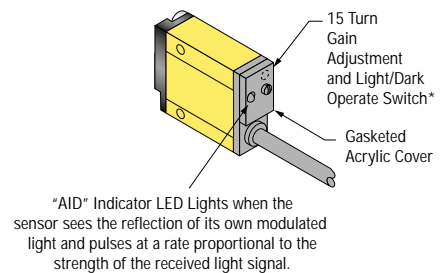
- 3) Repeat the alignment motions after each GAIN reduction. When you have found the sensor orientation that produces the fastest pulse rate, mount the sensor solidly in that position. Increase the receiver GAIN to maximum. Test the system by removing the object from the sensing position. The alignment LED indicator should go “off”. If the LED indicator does not go “off”, the sensor is reacting to light reflected from a background surface. Reduce the GAIN setting until the alignment indicator goes “off”, plus two additional full turns. Again place the object in the sensing position. If the alignment indicator does not come “on”, the sensor is receiving as much or more light energy from the background as from the object. Consider the following alternatives:

- a) move the sensor closer to the object and reduce the sensitivity (GAIN);
- b) reduce background reflectivity by painting the background with flat-black paint, or by scuffing the background or cutting a hole through it;
- c) tilt the sensor or the background so that the sensing beam is not perpendicular to the background.

### DIFFUSE MODE ALIGNMENT



### SM312W and SM312DBZ



#### \* Note regarding Light/Dark operate switch:

- Turn switch *fully* clockwise for light operate (sensor outputs conduct when sensing light is present)
- Turn switch *fully* counterclockwise for dark operate (sensor outputs conduct when sensing light is not present)