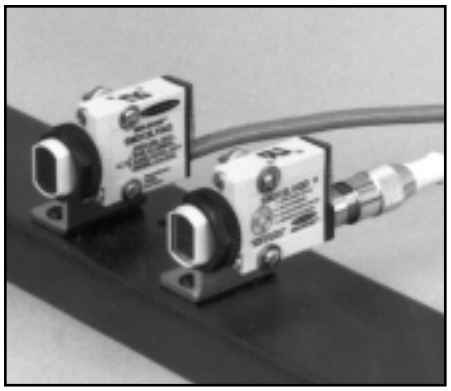
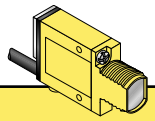
BANNER®
the photoelectric specialist

MINI-BEAM® SM312LV, SM312LVAG and SM312LP

Self-contained DC-operated Retroreflective Mode Sensors



- Compact, modulated, self-contained retroreflective sensors for 10-30V dc operation
- Choose standard visible model for highest excess gain and greatest range, or polarized models for detection of shiny objects
- Includes Banner's exclusive AID™ alignment system; US patent number 4356393
- Switch-selectable for light operate or dark operate
- Highly repeatable 1 millisecond response
- Both sourcing and sinking outputs (150 mA max. each); continuous overload and short-circuit protected
- Physically and electrically interchangeable with 18 mm barrel-type photoelectrics

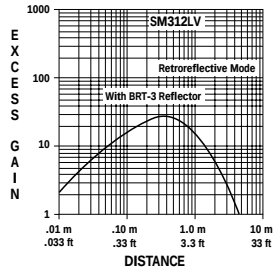
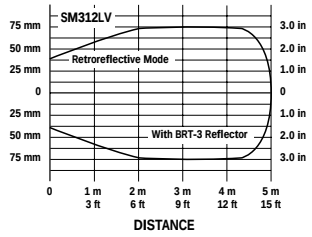
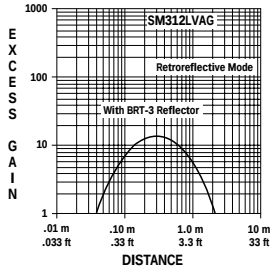
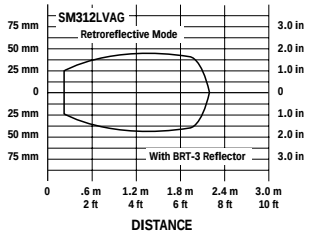
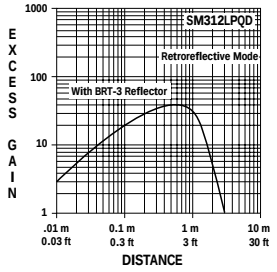
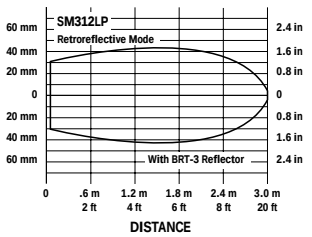


NOTE: Retroreflective range is specified using one model BRT-3 retroreflector (3" diameter). Actual sensing range may be more or less than specified, depending upon the efficiency and reflective area of the retroreflector(s) used. See the Banner Photoelectric Sensors catalog for more information on available retroreflectors.

Visible red, 650 nm

Non-Polarized *Polarized*

DC MINI-BEAM Retroreflective Mode Models

Models*	Range	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
Non-Polarized						
SM312LV **SM312LVQD**	5 m (15')	2 m (6.5') 4-Pin Euro QD	10-30V dc	Bipolar NPN/PNP		
Polarized						
SM312LVAG **SM312LVAGQD**	50 mm to 2 m (2" to 7')	2 m (6.5') 4-Pin Euro QD	10-30V dc	Bipolar NPN/PNP		
Extended Range Polarized						
SM312LP **SM312LPQD**	10 mm to 3 m (0.4" to 10')	2 m (6.5') 4-Pin Euro QD	10-30V dc	Bipolar NPN/PNP		

*See notes on page 3.

MINI-BEAM Installation and Alignment

Proper operation of these sensors requires that they be mounted securely and aligned properly. For best results, final-mount these sensors in an 18 mm hole by their threaded barrel or use one of the available mounting brackets, (see pages 6 - 7).

1) Begin with the sensor at the desired distance from the retro target and at the approximate position where it will be mounted. An object at the sensing position should pass through the “core” of the sensor’s light beam.

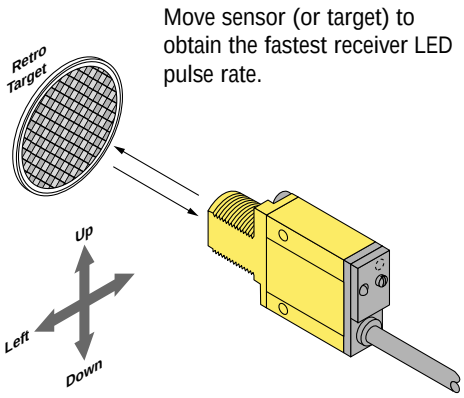
2) Apply power to the sensor, and advance the sensor’s 15-turn GAIN control to maximum (clockwise end of rotation). If the sensor is “seeing” the reflected light beam, the alignment LED should be “on”. Move the sensor up-down-right-left to obtain the fastest receiver LED pulse rate. (alternatively, the retro target may be moved.) If a pulse is not observable (too fast to count), reduce the GAIN control (counterclockwise rotation) to obtain a countable pulse rate. (As an aid to alignment, it may be necessary to further reduce the strength of the light signal by tape-masking a portion of the retroreflective target area.)

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 (or reflector) solidly in that position. Increase the receiver GAIN to maximum. Test the system by placing the object to be detected into the sensing position. The indicator should go “off”. If an “LV” model sensor’s indicator does not go “off” at this point, the sensor is reacting to light reflected from the object (“proxing”).

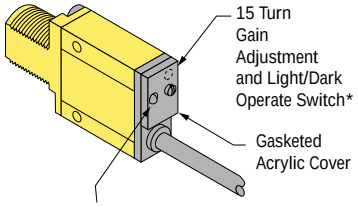
   If proxing occurs, reduce the GAIN setting until the alignment indicator goes “off”, plus two additional full turns. Remove the object from the sensing position and check that the alignment indicator LED comes “on” and pulses at a rate of at least two flashes per second. Confirm that the LED goes “off” when the object is replaced.

   Proxing can be avoided by mounting the sensor so that it’s light beam is not perpendicular to any flat reflective surface on the object to be detected (an angle of 10 to 15 degrees is usually sufficient). Also, at distances of a few feet or more, using more than one reflector may increase sensing contrast between object-present and object-absent.

Retroreflective Mode Alignment



Move sensor (or target) to obtain the fastest receiver LED pulse rate.



“AID” Indicator LED Lights when the sensor sees the reflection of its own modulated light and pulses at a rate proportional to the received light signal.

*** Note regarding Light/Dark operate switch:**
- Turn switch *fully* clockwise for light operate (sensor outputs conduct when sensing light is received)
- Turn switch *fully* counterclockwise for dark operate (sensor outputs conduct when sensing light is not received)

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