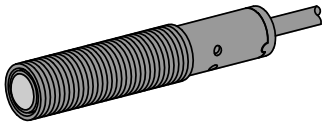
# EZ-BEAM® S12 Series Opposed-Mode Sensor Pairs

## Datasheet

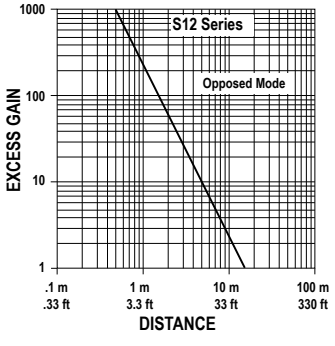
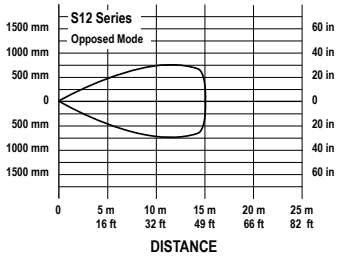


- Economical opposed-mode (beam-break) sensor pairs in 12 mm diameter barrel-style housings
- Sensing range of 15 m (50 ft)
- Totally self-contained; 10 V DC to 30 V DC operation
- Complementary outputs: one normally open, one normally closed; choice of NPN or PNP configuration, 100 mA max. (continuous)
- One output may be used as a marginal signal alarm
- LED status indicators for Power On, Output Overload, Object Sensed, and Low Gain conditions

**WARNING:**

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

## Models

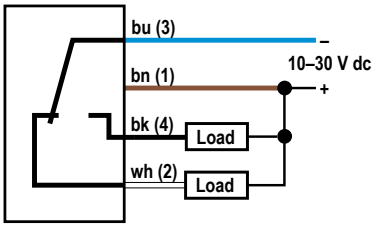
| Visible Red, 680 nm | | | | |
|---|---|---|---|---|
| **Models** [1] | **Cable** | **Output Type** | **Excess Gain** | **Beam Pattern (Effective beam: 8.1 mm)** |
| S126E Emitter | 2 m (6.5 ft) | - |  |  |
| S126EQP Emitter | Integral 4-pin M8 male quick-disconnect connector | | | |
| S12SN6R Receiver | 2 m (6.5 ft) | NPN | | |
| S12SN6RQP Receiver | Integral 4-pin M8 male quick-disconnect connector | | | |
| S12SP6R Receiver | 2 m (6.5 ft) | PNP | | |
| S12SP6RQP Receiver | Integral 4-pin M8 male quick-disconnect connector | | | |



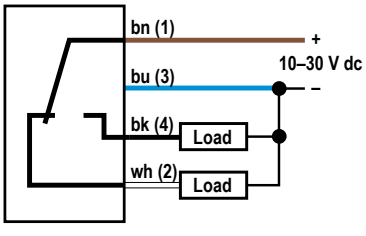


## Wiring Diagrams

**Receivers with NPN Outputs (Standard)**




**Receivers with PNP Outputs (Standard)**




**Key**

1 - Brown
2 - White
3 - Blue
4 - Black

[1] Integral 2 m (6.5 ft) unterminated cable models and 4-pin M8 integral quick disconnect models are listed.

- To order the 9 m (30 ft) PVC cable model, add the suffix "W/30" to the cabled model number.
- Models with a quick disconnect require a mating cordset.

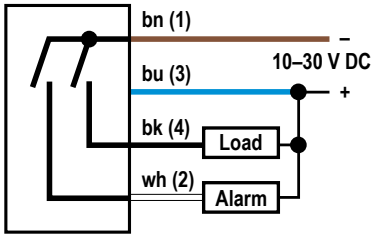
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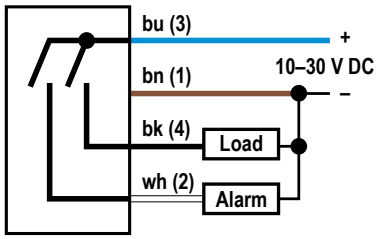
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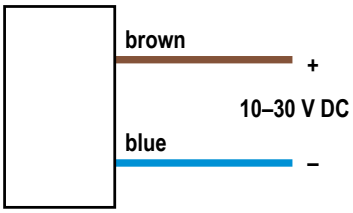
| Receivers with NPN Outputs (Alarm) | Receivers with PNP Outputs (Alarm) | Key |
|---|---|---|

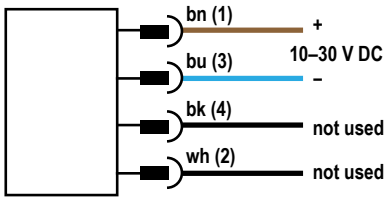



1 - Brown
2 - White
3 - Blue
4 - Black

| Emitters with Attached Cable | Emitters with Quick Disconnect | Key |
|---|---|---|




1 - Brown
2 - White
3 - Blue
4 - Black

## Specifications

**Supply Voltage and Current**
10 V DC to 30 V DC (10% maximum ripple)
Supply current (exclusive of load current): Opposed Mode Emitters: 25 mA; Opposed Mode Receivers: 20 mA

**Supply Protection Circuitry**
Protected against reverse polarity and transient voltages

**Output Configuration**
SPDT (complementary) solid-state DC switch; choose NPN or PNP models
Light operate: N.O. output conducts when the sensor sees the emitter's modulated light
Dark operate: N.C. output conducts when the sensor sees dark; the N.C. (normally closed) output may be wired as a normally open marginal signal alarm output, depending upon hookup to the power supply (U.S. patent 5087838)

**Output Rating**
100 mA maximum (each) in standard wiring; when wired for alarm output, the total load may not exceed 100 mA
Off-state leakage current < 1 microamp at 30 V DC
On-state saturation voltage < 1 V at 10 mA DC and < 1.5 V at 150 mA DC

**Output Protection Circuitry**
Protected against output short-circuit, continuous overload, and false pulse on power-up

**Output Response Time**
3 milliseconds ON, 1.5 milliseconds OFF
100 millisecond delay on power-up; outputs are non-conducting during this time

**Repeatability**
375 microseconds; repeatability and response are independent of signal strength

**Indicators**
Receivers have two LEDs: green and amber
Green solid: power to sensor is on
Green flashing: output is overloaded (DC models only)
Amber solid: normally open output is conducting
Amber flashing: excess gain marginal (1–1.5x) in light condition

**Construction**
Reinforced thermoplastic polyester housings; polycarbonate lenses; polyurethane end cap

**Environmental Rating**
Leakproof design rated NEMA 6P (IP67)

**Connections**
2 m (6.5 ft) unterminated 4-wire PVC-jacketed cable, 9 m (30 ft) unterminated 4-wire PVC-jacketed cable, or Integral 4-pin M8 male quick-disconnect connector

**Operating Conditions**
Temperature: –40 °C to +70 °C (–40 °F to +158 °F)
Maximum relative humidity: 90% at +50 °C maximum relative humidity (non-condensing)

**Vibration and Mechanical Shock**
All models meet MIL-STD-202F requirements.
Method 201A (Vibration: 10 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude, 10G maximum acceleration).
Method 213B conditions H&I (Shock: 75G with device operating; 100G for non-operation).

**Certifications**

**Banner Engineering Europe** Park Lane, Culliganlaan 2F bus 3, 1831 Diegem, BELGIUM

**Turck Banner LTD** Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain

## Dimensions

*Figure 1. Cabled Models*

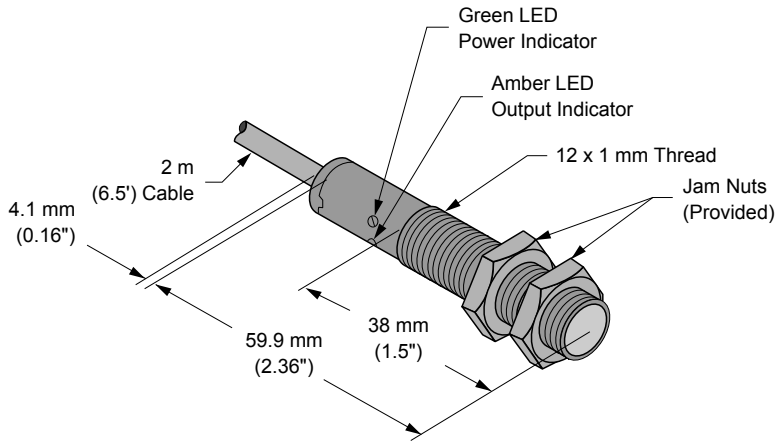
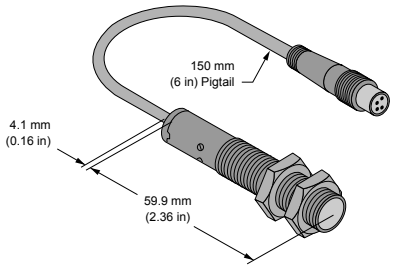
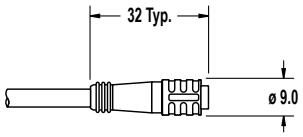
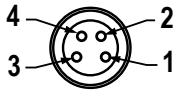
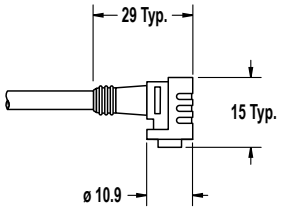
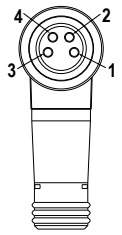



*Figure 2. Quick-Disconnect Models*




## Accessories

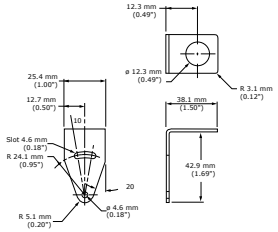
### Cordsets

| 4-Pin Snap-on M8 Cordsets—Single Ended | | | | | |
|---|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** | |
| **PKG4-2** | 2.03 m (6.66 ft) | Straight |   |   | 1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black |
| **PKW4Z-2** | 2 m (6.56 ft) | Right-Angle |   |   | |

### Brackets

**SMB12MM**

- 12-gauge, stainless steel, right-angle mounting bracket for barrel-style sensors with 12 mm threads
- Curved mounting slot allows the bracket ±10° of lateral movement
- Mounting holes accommodate #8 hardware




**Hole center spacing:** A to B = 26.0

**Hole size:** A = ø 4.6, B = 12.8 x 4.6, C= ø 12.3

## Aperture Kits

SP12 sensors may be fitted with apertures that narrow or shape the effective beam of the sensor and protect the sensor's lens. These apertures are rectangular or circular thread-on water-tight parts. Use of apertures with SP12 high-gain sensors makes it possible to create very narrow, concentrated sensing beams for precision sensing applications.

| Model | Description | Dimensions |
|---|---|---|
| **AP12SC** | Includes lens, o-ring, thread-on housing, and 3 circular apertures with openings of:<br>• 0.5 mm (0.02 inch) diameter<br>• 1.0 mm (0.04 inch) diameter<br>• 2.5 mm (0.10 inch) diameter |  |
| **AP12SR** | Includes lens, o-ring, thread-on housing, and 3 rectangular apertures with openings of:<br>• 0.5 mm (0.02 inch) wide<br>• 1.0 mm (0.04 inch) wide<br>• 2.5 mm (0.10 inch) wide | |

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