# M12 Series Metal Barrel Sensor

Original Instructions
p/n: 129721 Rev G
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ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

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# Chapter 1 Features

Rugged, self-contained sensors in a 12 mm threaded barrel



- Complete family of sensors, all housed in a compact 12 mm threaded metal barrel
- Opposed, retroreflective, polarized retroreflective, diffuse and 25, 50, or 75 mm cutoff fixed-field mode operation, depending on model
- Excellent background suppression on fixed-field models; an excellent alternative to proximity sensors
- Two signal indicator LEDs for easy operating status monitoring from any direction
- 10 V DC to 30 V DC operation
- Complementary solid-state outputs (one normally open, one normally closed); PNP or NPN, depending on model

**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

*Opposed mode sensors*

| Models | Range | Output | Connection |
|---|---|---|---|
| M12E Emitter | 5 m (16.4 ft) | NA | 2 m cable |
| M12EQ5 Emitter | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12EQ8 Emitter | | | 4-pin integral M12 male connector |
| M12PR Receiver | | PNP | 2 m cable |
| M12PRQ5 Receiver | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PRQ8 Receiver | | | 4-pin integral M12 male connector |
| M12NR Receiver | | NPN | 2 m cable |
| M12NRQ8 Receiver | | | 4-pin integral M12 male connector |

*Polarized retroreflective mode sensors*

| Models | Range | Output | Connection |
|---|---|---|---|
| M12PLPQ5 | 1.5 m (4.9 ft) | PNP | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PLPQ8 | | | 4-pin integral M12 male connector |

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Continued from page 3

| Models | Range | Output | Connection |
|---|---|---|---|
| M12NLPQ8 | | NPN | 4-pin integral M12 male connector |

*Retroreflective mode sensors*

| Models | Range | Output | Connection |
|---|---|---|---|
| M12PLV | 2.5 m (8.2 ft) | PNP | 2 m cable |
| M12PLVQ8 | | | 4-pin integral M12 male connector |
| M12NLV | | NPN | 2 m cable |
| M12NLVQ8 | | | 4-pin integral M12 male connector |
| M12NLVQPMA | | | 150 mm (6 in) PUR cable with a 4-pin M12 male connector |

Polarized retroreflective and retroreflective range is specified using one model BRT-84 retroreflector. Actual sensing range may be more or less than specified, depending upon efficiency and reflective area of the retroreflector(s) used.

*Divergent diffuse mode sensors*

| Models | Range | Output | Connection |
|---|---|---|---|
| M12PD | 400 mm (15.7 in) | PNP | 2 m cable |
| M12PDQ5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PDQ8 | | | 4-pin integral M12 male connector |
| M12ND | | NPN | 2 m cable |
| M12NDQ5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12NDQ8 | | | 4-pin integral M12 male connector |

Divergent diffuse and fixed-field performance based on the use of 90% reflectance white test card.

*Fixed-field mode sensors*

| Models | Range | Output | Connection |
|---|---|---|---|
| M12PFF25 | 25 mm (1 in) cutoff; 25 mm (1 in) focus | PNP | 2 m cable |
| M12PFF25 W/30 | | | 9 m cable |
| M12PFF25Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PFF25QPMA | | | 150 mm (6 in) PUR cable with a 4-pin M12 male connector |
| M12PFF25Q8 | | | 4-pin integral M12 male connector |
| M12NFF25 | | NPN | 2 m cable |
| M12NFF25Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12NFF25Q8 | | | 4-pin integral M12 male connector |
| M12PFF50 | 50 mm (2 in) cutoff; 25 mm (1 in) focus | PNP | 2 m cable |
| M12PFF50Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PFF50Q8 | | | 4-pin integral M12 male connector |
| M12NFF50 | | NPN | 2 m cable |
| M12NFF50Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12NFF50Q8 | | | 4-pin integral M12 male connector |
| M12PFF75 | 75 mm (3 in) cutoff; 25 mm (1 in) focus | PNP | 2 m cable |

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| Models | Range | Output | Connection |
|---|---|---|---|
| M12PFF75Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12PFF75Q8 | | | 4-pin integral M12 male connector |
| M12PFF75QPMA | | | 150 mm (6 in) PUR cable with a 4-pin M12 male connector |
| M12NFF75 | | NPN | 2 m cable |
| M12NFF75Q5 | | | 150 mm (6 in) cable with a 4-pin M12 male connector |
| M12NFF75Q8 | | | 4-pin integral M12 male connector |

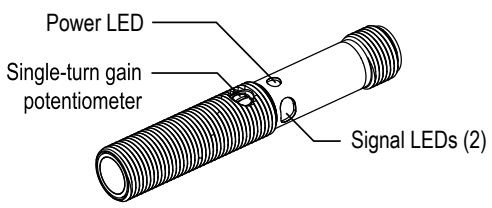
All other models in this product family are no longer available for order but are still covered by the information in this document.

# Overview

Banner's M12 family of sensors offers a full complement of sensing modes, all packaged in a compact yet rugged metal housing. The 12 mm barrel design allows them to mount easily into tight spaces, with the excellent performance expected of much larger sensors.

The single-turn Gain potentiometer on most models and two Signal LEDs (positioned on either side of the housing for visibility) provide easy alignment and configuration for reliable sensing (see "Figure: Features" on page 5). Note that when the signal LED is not ON, the green Power LED is visible through all three LED ports.

*Features*




| LED Status | Description |
|---|---|
| Green on | Power on |
| Green flashing | Output overloaded |
| Amber on | Light sensed |
| Amber flashing | Marginal excess gain |

## Fixed-Field Overview

M12 Series fixed-field sensors are powerful diffuse-mode sensors with far-limit cutoff (a type of background suppression). Their high excess gain and fixed-field technology allow them to detect objects of low reflectivity that are directly in front of another surface, while ignoring the surface in the background.

The cutoff distance is fixed. Background and background objects must *always* be placed beyond the cutoff distance.

As a general rule, the most reliable sensing of an object approaching from the side occurs when the line of approach is parallel to the sensing axis.

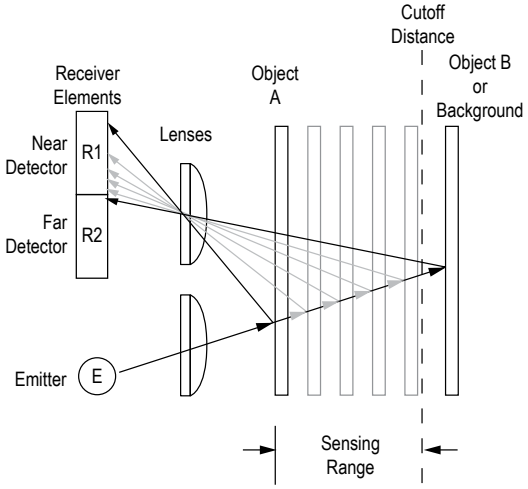
## Fixed-Field Sensing Theory of Operation

The M12 Series Metal Barrel Sensor compares the reflections of its emitted light beam (E) from an object back to the sensor's two differently aimed detectors, R1 and R2. See "Figure: Fixed-Field Concept" on page 6. If the near detector's (R1) light signal is stronger than the far detector's (R2) light signal (see object A in the Figure below, closer than the cutoff distance), the sensor responds to the object. If the far detector's (R2) light signal is stronger than the near detector's (R1) light signal (see object B in the Figure below, beyond the cutoff distance), the sensor ignores the object.


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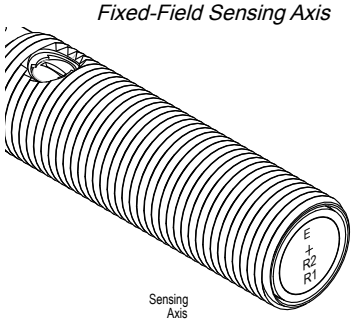
The cutoff distance for the M12 is fixed at 25, 50, or 75 mm (1, 2, or 3 inches). Objects lying beyond the cutoff distance are usually ignored, even if they are highly reflective. However, under certain conditions, it is possible to falsely detect a background object (see "Background Reflectivity and Placement" on page 7).

*Fixed-Field Concept*




Object is sensed if amount of light at R1 is greater than the amount of light at R2

*Fixed-Field Sensing Axis*




In the drawings and information provided in this document, the letters E, R1, and R2 identify how the sensor's three optical elements (Emitter "E", Near Detector "R1", and Far Detector "R2") line up across the face of the sensor. The location of these elements defines the sensing axis, see "Figure: Fixed-Field Sensing Axis" on page 6.

The sensing axis becomes important in certain situations, such as when the object is beyond the cutoff distance as shown in "Background Reflectivity and Placement" on page 7.


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# Chapter 2 Configuration Instructions

## Sensing Reliability

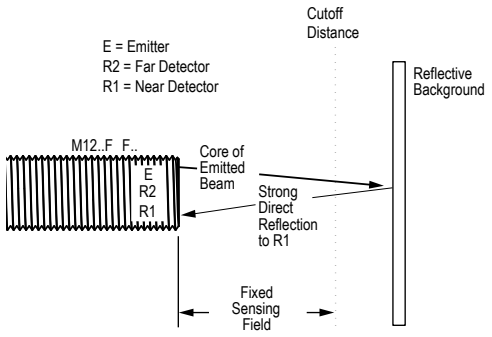
For the highest sensitivity, position the target for sensing at or near the point of maximum excess gain. UNKNOWN Sensing at or near this distance makes maximum use of each sensor's available sensing power. The background must be placed beyond the cutoff distance. Note that the reflectivity of the background surface also may affect the cutoff distance. Following these guidelines improves sensing reliability.

## Background Reflectivity and Placement

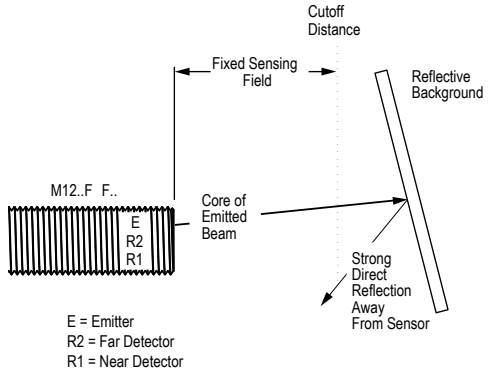
Avoid mirror-like backgrounds that produce specular reflections. A false sensor response occurs if a background surface reflects the sensor's light more to the near detector (R1) than to the far detector (R2). The result is a false ON condition ("Figure: Reflective Background - Problem" on page 7). Correct this problem by using a diffusely reflective (matte) background or angling either the sensor or the background (in any plane) so the background does not reflect light back to the sensor ("Figure: Reflective Background - Solution" on page 7). Position the background as far beyond the cutoff distance as possible.

An object beyond the cutoff distance, either stationary (and when positioned as shown in "Figure: Object Beyond Cutoff - Problem" on page 8), or moving past the face of the sensor in a direction perpendicular to the sensing axis, may cause unwanted triggering of the sensor if more light is reflected to the near detector than to the far detector. Correct the problem by rotating the sensor 90° ("Figure: Object Beyond Cutoff - Solution" on page 8). The object then reflects the R1 and R2 fields equally, resulting in no false triggering. A better solution, if possible, may be to reposition the object or the sensor.

*Reflective Background - Problem*




*Reflective Background - Solution*

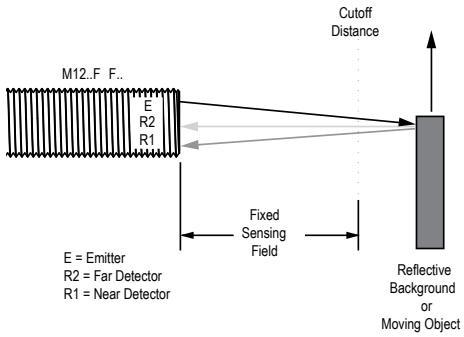



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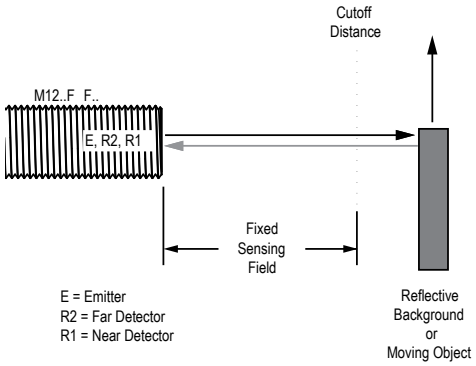
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*Object Beyond Cutoff - Problem*




A reflective background object in this position or moving across the sensor face in this axis and direction may cause a false sensor response.

*Object Beyond Cutoff - Solution*




A reflective background object in this position or moving across the sensor face in this axis is ignored.

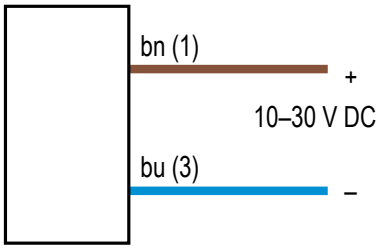
# Color Sensitivity

The effects of object reflectivity on cutoff distance, though small, may be important for some applications. It is expected that at any given cutoff setting, the actual cutoff distance for lower reflectance targets is slightly shorter than for higher reflectance targets. This behavior is known as color sensitivity.

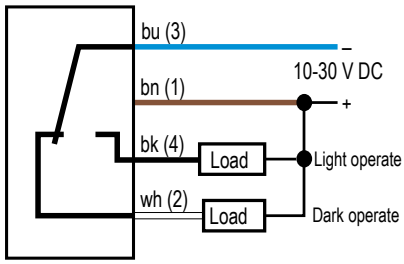
These excess gain curves were generated using a white test card of 90% reflectance. Objects with reflectivity of less than 90% reflect less light back to the sensor and thus require proportionately more excess gain to be sensed with the same reliability as more reflective objects. When sensing an object of very low reflectivity, it may be essential to sense it at or near the distance of maximum excess gain.

# Wiring Diagrams

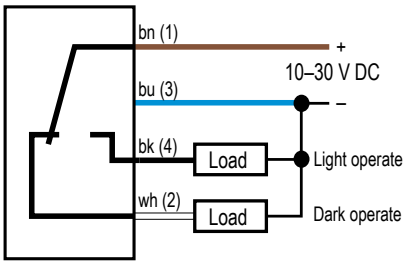
*Emitter*



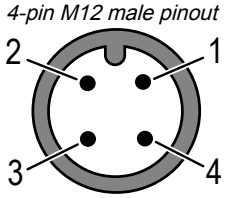

*NPN Models*




*PNP Models*




*4-pin M12 male pinout*




**Key**

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


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# Chapter 3 Installation Instructions

## Mount the Device

1. If a bracket is needed, mount the device onto the bracket.
2. Mount the device (or the device and the bracket) to the machine or equipment at the desired location. Do not tighten the mounting screws at this time.
3. Check the device alignment.
4. Tighten the mounting screws to secure the device (or the device and the bracket) in the aligned position.


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# Chapter 4 Specifications

**Sensing Beam**

Fixed Field Models: Visible red, 680 nm

All Other Models: Visible red, 660 nm

**Supply Voltage and Current**

10 V DC to 30 V DC (10% max. ripple) at 20 mA current, exclusive of load

**Supply Protection Circuitry**

Protected against reverse polarity and transient voltages

**Output Configuration**

Complementary (one normally open and one normally closed) solid-state, NPN, or PNP, depending on model

**Output Ratings**

100 mA total across both outputs with overload and short circuit protection

**OFF-state leakage current:**

- **NPN:** less than 200 µA at 30 V DC (see Application Note)
- **PNP:** less than 10 µA at 30 V DC

**ON-state saturation voltage:**

- **NPN:** less than 1.6 V at 100 mA
- **PNP:** less than 3.0 V at 100 mA

**Output Protection Circuitry**

Protected against output short-circuit and false pulse on power-up

**Output Response Time**

**Opposed Mode:** 625 µs ON/375 µs OFF

**All Other Modes:** 500 µs ON and OFF

**NOTE:** 100 ms delay on power-up; outputs do not conduct during this time.

**Repeatability**

**Opposed Mode:** 85 µs

**All Other Modes:** 95 µs

**Indicators**

Two Status (amber) and one Power (green) LED (see "Figure: Features" on page 5)

**Adjustments**

**Fixed-Field Models:** None

**All Other Models:** Single-turn Gain (sensitivity) potentiometer

**Construction**

**Housing:** Nickel-plated brass

**Lenses:** PMMA

**Cable Endcap and Gain Potentiometer Adjuster:** PBT

**Environmental Rating**

IP67; NEMA 6, IP68, and 1200 PSI washdown, NEMA ICS 5 Annex F-2002

**Connections**

2 m (6.5 ft) or 9 m (30 ft) 4-wire PVC-jacketed cable, Integral 4-pin M12 male quick-disconnect connector, or 150 mm (6 in) cable with a 4-pin M12 fitting, depending on model

**Operating Conditions**

**Operating Temperature:** –20 °C to +60 °C (–4 °F to +140 °F)

90% at +50 °C maximum relative humidity (non-condensing)

**Application Notes**

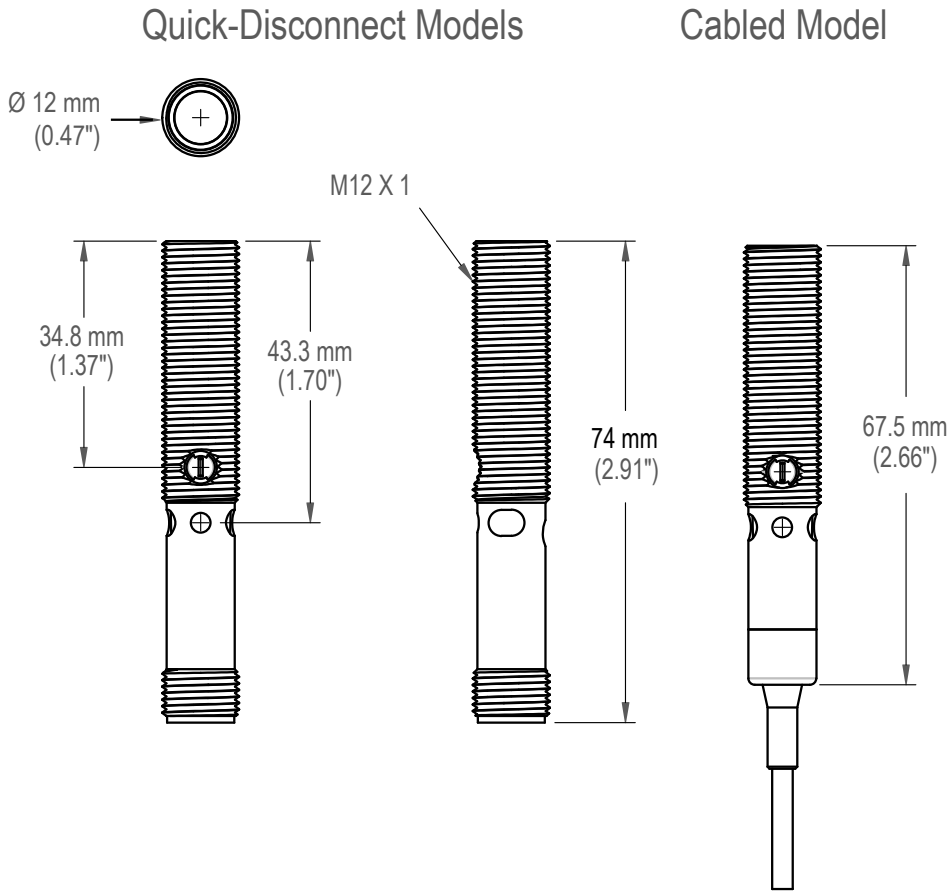
NPN off-state leakage current is < 200 µA for load resistances > 3 kΩ or optically isolated loads. For load current 100 mA, leakage is <1% of load current.

**Certifications**

CE


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# Dimensions



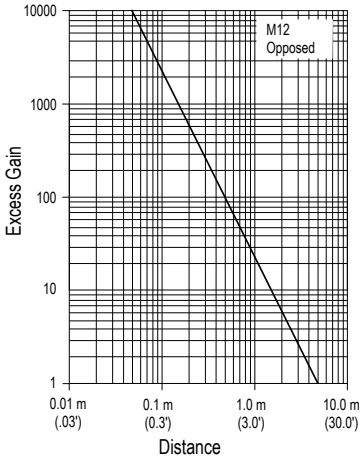

# Performance Curves

## Excess Gain

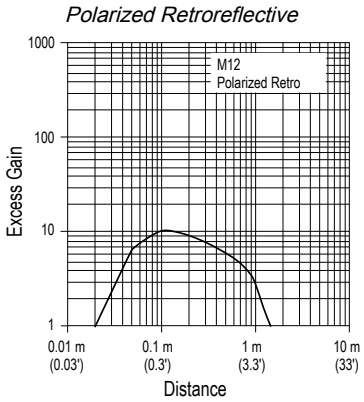
For the polarized retroreflective and retroreflective models, the performance is based on a model BRT-84 retroreflector. For the diffuse model, the performance is based on a 90% reflectance white test card.


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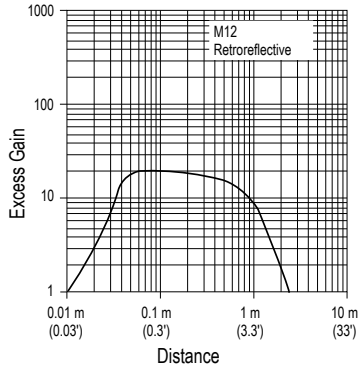
*Opposed*



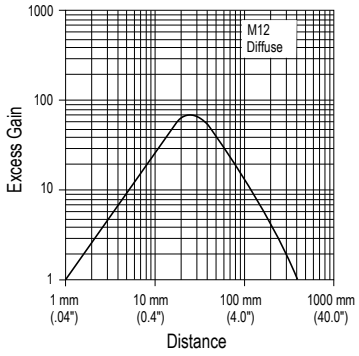

*Polarized Retroreflective*



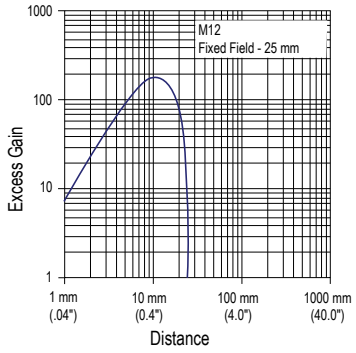

*Retroreflective*




*Diffuse*




*Fixed-Field – 25 mm*



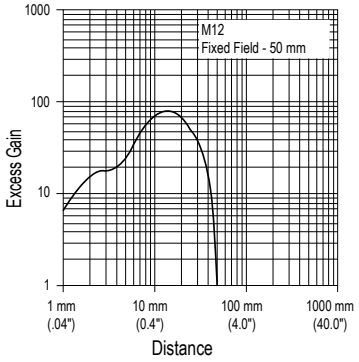

| |
|---|
| Ø 2 mm spot size at 25 mm focus |
| Ø 2 mm spot size at 25 mm focus |
| Focus and spot sizes are typical |
| Performance is based on the use of a 90% reflectance white test card. |
| Using 18% gray test card, the cutoff distance will be 96% of the value shown |
| Using 6% black test card, the cutoff distance will be 94% of the value shown |

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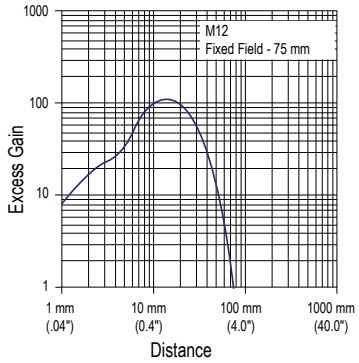
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*Fixed-Field – 50 mm*




| |
|---|
| Ø 2 mm spot size at 25 mm focus |
| Ø 7 mm spot size at 50 mm focus |
| Focus and spot sizes are typical |
| Performance is based on the use of a 90% reflectance white test card. |
| Using 18% gray test card, the cutoff distance will be 90% of the value shown |
| Using 6% black test card, the cutoff distance will be 85% of the value shown |

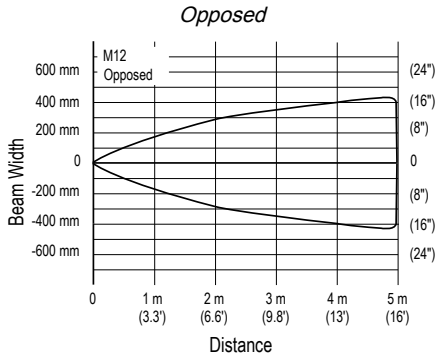
*Fixed-Field – 75 mm*



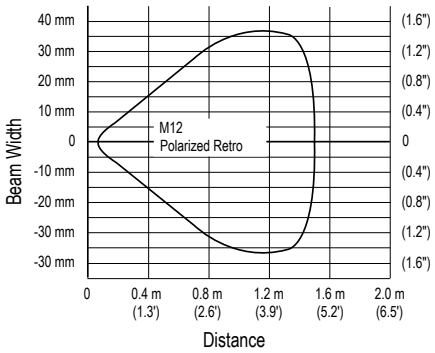

| |
|---|
| Ø 2 mm spot size at 25 mm focus |
| Ø 13 mm spot size at 75 mm focus |
| Focus and spot sizes are typical |
| Performance is based on the use of a 90% reflectance white test card. |
| Using 18% gray test card, the cutoff distance will be 80% of the value shown |
| Using 6% black test card, the cutoff distance will be 70% of the value shown |

## Beam Pattern

*Opposed*




*Polarized Retro*

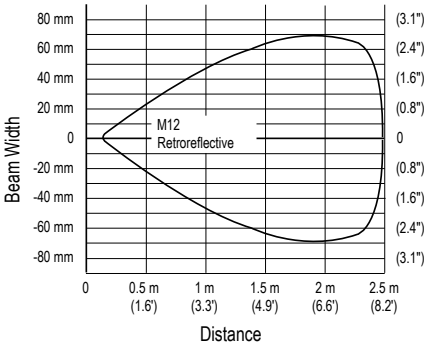



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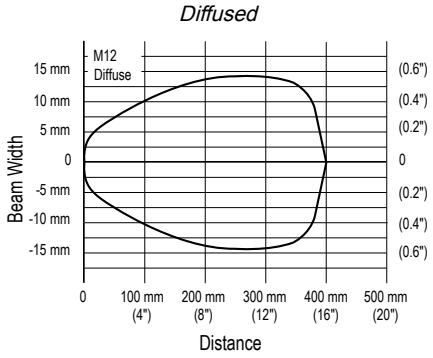

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*Retro*




*Diffused*




Performance based on the use of a model BRT-84 retroreflector.

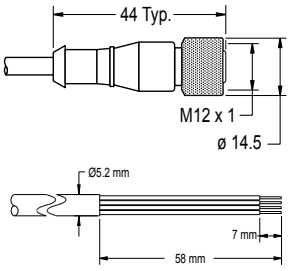
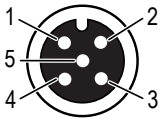
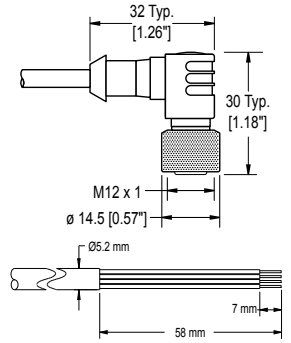
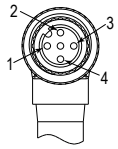

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# Chapter 5 Accessories

## Cordsets

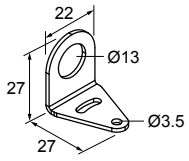
| 4-Pin Single-Ended M12 Female Cordsets | | | | | |
|---|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** | |
| **MQDC-406** | 2 m (6.56 ft) | Straight |  |  | 1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black<br>5 = Not used<br>c UL us |
| **MQDC-415** | 5 m (16.4 ft) | | | | |
| **MQDC-430** | 9 m (29.5 ft) | | | | |
| **MQDC-450** | 15 m (49.2 ft) | | | | |
| **MQDC-406RA** | 2 m (6.56 ft) | Right-Angle |  |  | |
| **MQDC-415RA** | 5 m (16.4 ft) | | | | |
| **MQDC-430RA** | 9 m (29.5 ft) | | | | |
| **MQDC-450RA** | 15 m (49.2 ft) | | | | |

## Brackets

**SMBQS12PD**

- Right-angle, nose-mount bracket
- 16-ga. 300 series stainless steel
- CAD Files: DXF, PDF, IGS, STP

**Hole center spacing:** A to B = 14.0
**Hole size:** A = ø 3.5, B = 3.5 x 10.6, C = ø 13.0





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# Chapter 6 Product Support and Maintenance

## Repairs and Translations (No Field-Replaceable Parts)

### English

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

```
IMPORTANT: If instructed to return the device, pack it with care. Damage that occurs in return
shipping is not covered by warranty.
```

Obtain assistance with product repairs by contacting your local Banner Engineering Corp distributor or by calling Banner directly at (763) 544-3164. Access literature translated into your native language on the Banner website at www.bannerengineering.com or contact Banner directly at (763) 544-3164.

### Deutsch

Wenden Sie sich zur Fehlerbehebung dieses Geräts an Banner Engineering. **Versuchen Sie nicht, Reparaturen an diesem Banner-Gerät vorzunehmen. Das Gerät enthält keine am Einsatzort auszuwechselnden Teile oder Komponenten.** Wenn ein Banner-Anwendungstechniker zu dem Schluss kommt, dass dieses Gerät, ein Teil oder eine Komponente davon defekt ist, erhalten Sie von dem Techniker Erläuterungen zu Banners RMA-Verfahren (Return Merchandise Authorization) für die Warenrückgabe.

```
WICHTIG: Wenn Sie der Techniker anweist, das Gerät zurückzusenden, verpacken Sie es bitte
sorgfältig. Transportschäden bei der Rücksendung werden von der Garantie nicht abgedeckt.
```

Unterstützung bei Produktreparaturen erhalten Sie von Ihrem örtlichen Banner Engineering Corp Händler oder direkt von Banner unter Tel. (763) 544-3164. Die in Ihre Muttersprache übersetzte Literatur finden Sie auf der Banner-Website unter www.bannerengineering.com oder kontaktieren Sie Banner direkt unter Tel. (763) 544-3164.

### Français

Pour plus d'informations sur le dépannage du produit, contactez Banner Engineering. **Ne tentez pas de réparer ce dispositif Banner. Il ne contient aucun composant ou pièce qui puisse être remplacé sur place.** Si un ingénieur de Banner conclut que le dispositif ou l'une de ses pièces ou composants est défectueux, il vous informera de la procédure à suivre pour le retour des produits (RMA).

```
Important : Si vous devez retourner le dispositif, emballez-le avec soin. Les dégâts
occasionnés pendant le transport de retour ne sont pas couverts par la garantie.
```

Pour vous aider lors de la réparation de produits, contactez votre distributeur Banner local our appelez directement Banner au (763) 544-3164. La documentation traduite dans votre langue est disponible sur le site internet de Banner www.bannerengineering.com ou contactez directement Banner au (763) 544-3164.


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### Italiano

Per le procedure di individuazione e riparazione dei guasti di questo dispositivo, contattare Banner Engineering. **Non tentare di riparare questo dispositivo Banner, in quanto non contiene parti o componenti sostituibili dall'utente.** Se il dispositivo, una parte del dispositivo o un componente del dispositivo viene riscontrato difettoso da un tecnico Banner, il nostro personale vi comunicherà la procedura da seguire per ottenere l'autorizzazione al reso.

**Importante:** Se si ricevono istruzioni di rispedire il dispositivo al produttore, imballarlo con cura. I danni dovuti al trasporto non sono coperti dalla garanzia.

Per assistenza nelle riparazioni dei prodotti, contattare il distributore locale Banner Engineering Corp o contattare direttamente Banner al numero (763) 544-3164. È possibile accedere alla documentazione tradotta nella propria lingua madre sul sito Web Banner all'indirizzo www.bannerengineering.com o contattare direttamente Banner al numero (763) 544-3164.

### Español

Comuníquese con Banner Engineering para solucionar de problemas de este dispositivo. **No intente ninguna reparación a este dispositivo de Banner, contiene piezas o componente que no se pueden cambiar en terreno.** Si algún ingeniero de aplicaciones de Banner determina que el dispositivo, alguna de las piezas o alguno de los componentes del dispositivo está defectuoso, le informará el procedimiento de autorización de devolución de mercancía (RMA, por sus siglas en inglés) de Banner.

**Importante:** Si se le solicita devolver el dispositivo, empáquelo con cuidado. Puede haber daños durante el envío de devolución que no estén cubiertos por la garantía.

Para reparaciones de productos, por favor contacte a su distribuidor local de Banner Engineering o llame a Banner directamente al 00 1 (763) 544-3164. Vea la literatura traducida en su idioma en el sitio web Banner en www.bannerengineering.com o comuníquese con Banner directamente al 00 1 (763) 544-3164.

### 中国人

如需对本装置进行故障排查，请联系邦纳。**请勿尝试自行维修该邦纳装置；本装置不包含任何可在现场更换的部件或组件。** 若经邦纳应用工程师确认设备、设备部件或组件存在缺陷，他们将告知您邦纳退货授权 (RMA) 流程。

**重要注意事项：** 如被要求退回装置，请妥善包装后寄回。退货运输过程中发生的损坏不在保修范围内。

请联系当地的 Banner Engineering Corp 经销商或直接致电 Banner +1 (763) 544-3164，以获得产品维修帮助。请访问邦纳网站 www.bannerengineering.com 或直接拨打 +1 (763) 544-3164 联系邦纳，获取翻译成您母语的资料。

### 한국인

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**중요:** 제품을 반송하도록 안내 받으셨다면 잘 포장해주십시오. 반송 도중에 발생한 손상은 보증 서비스가 적용되지 않습니다.

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### 日本語

この装置のトラブルシューティングについては、バナーエンジニアリングにお問い合わせください。**このバナー装置には、現場では交換できない部品またはコンポーネントが含まれているため、修理を試みてはいけません。** バナーのアプリケーションエンジニアが装置、装置の部品、または装置のコンポーネントに欠陥があると判断した場合、バナーのRMA（返品承認）手続きについてお知らせします。

**重要 ：** 返品を指示された場合は、装置を丁寧に梱包してください。返品時に発生した破損は保証の対象外となります。

製品の修理については、最寄りのBanner Engineering Corp代理店にお問い合わせいただくか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。バナーのウェブサイト（www.bannerengineering.com）でお客様の言語に翻訳された資料にアクセスするか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。


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### čeština

Pro řešení problémů se zařízením kontaktujte společnost Banner Engineering. **Neprovádějte žádné opravy zařízení Banner. Neobsahují žádné komponenty nebo části, které by byly vyměnitelné.** Pokud je zařízení, jeho část nebo díl označen technikem společnosti Banner jako poškozený, bude Vám doporučeno vyplnit reklamační RMA protokol.

```
Důležité: Pokud byl vydán požadavek na vrácení zařízení, pečlivě ho zabalte. Poškození vzniklé
při dopravě není považováno za záruční opravu.
```

Pokud produkt potřebuje opravu, vyžádejte si pomoc od místního distributora společnosti Banner Engineering Corp nebo přímo na telefonním čísle (763) 544-3164. Dokumentaci přeloženou do vašeho jazyka si vyhledejte na webových stránkách společnosti Banner na adrese www.bannerengineering.com nebo se obraťte přímo na společnost Banner na telefonním čísle (763) 544-3164.

### Polski

W celu rozwiązania problemów z urządzeniem należy skontaktować się z działem technicznym firmy Banner Engineering. **Pod żadnym pozorem nie próbuj naprawiać tego urządzenia firmy Banner; nie zawiera ono części ani elementów, które można wymieniać samodzielnie.** Jeśli urządzenie, jego część lub element zostaną uznane za wadliwe przez inżyniera technicznego Banner, poinformuje on użytkownika o firmowej procedurze zwrotu towaru (RMA) firmy Banner.

```
Ważne: Jeśli urządzenie ma zostać zwrócone, należy je starannie zapakować. Uszkodzenia powstałe
podczas odsyłki nie są objęte gwarancją.
```

Aby uzyskać pomoc w zakresie naprawy produktu, należy skontaktować się z lokalnym dystrybutorem Banner Engineering Corp lub zadzwonić bezpośrednio do firmy Banner pod numer (763) 544-3164. Dostęp do literatury przetłumaczonej na swój język ojczysty można uzyskać na stronie internetowej firmy Banner pod adresem www.bannerengineering.com lub kontaktując się bezpośrednio z firmą Banner pod numerem (763) 544-3164.

### Português

Entre em contato com a Engenharia da Banner para a solução de problemas deste dispositivo. **Não tente fazer nenhum reparo neste dispositivo Banner; ele não contém peças ou componentes substituíveis em campo.** Se um técnico de aplicações da Banner determinar que o dispositivo, peça ou componente do dispositivo está com defeito, ele o informará sobre o procedimento de RMA (Autorização de Devolução de Mercadoria) da Banner.

```
Importante: Se for instruído a devolver o dispositivo, embale-o com cuidado. Os danos ocorridos
no transporte de devolução não são cobertos pela garantia.
```

Obtenha assistência para reparos do produto entrando em contato com o distribuidor local da Banner Engineering Corp ou ligando diretamente para a Banner no telefone (763) 544-3164. Acesse a literatura traduzida para seu idioma nativo no site da Banner em www.bannerengineering.com ou entre em contato diretamente com a Banner pelo telefone (763) 544-3164.

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Bu cihazda sorun giderme işlemleri için Banner Engineering ile iletişime geçin. **Bu Banner cihazını onarmaya çalışmayın; cihaz sahada değiştirilebilir parça veya bileşen içermez.** Bir Banner Uygulama Mühendisi tarafından cihazın, cihazın bir parçasının veya bir cihaz bileşeninin kusurlu olduğu tespit edilirse, Banner RMA (İade Mal Yetkilendirme) prosedürü hakkında bilgilendirilirsiniz.

```
ÖNEMLİ: İade etmeniz istenirse, cihazı dikkatli bir şekilde paketleyin. İade nakliyesinde
meydana gelecek hasarlar garanti kapsamında değildir.
```

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# Contact Us

Banner Engineering Corp. | 9714 Tenth Avenue North | Plymouth, MN 55441, USA | Phone: + 1 888 373 6767

For worldwide locations and local representatives, visit www.bannerengineering.com.


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# Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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