

SM30 Series 30 mm Barrel Sensor



Opposed-Mode Infrared Photoelectric Sensors for Especially Demanding Applications



- Stainless steel or plastic barrel models
- Very high excess gain; 150 m (500 ft) sensing range; 880 nm Infrared LED
- Positive sealing eliminates even capillary leakage; lens is quad-ring sealed; exceeds NEMA 6P (IP67) ratings – ideal for equipment wash-down environments
- EZ-BEAM® technology provides reliable sensing without the need for adjustment
- Modulation frequency “A” is standard; frequencies “B” and “C” also available for preventing crosstalk in multiple-sensor applications (emitter and opposed receiver frequencies must match)
- AC- and DC-operated receiver models available; emitters feature Universal voltage
- Range for all models: 150 m (500 ft). See page 3 for performance curves.

| Modulation Frequency* | | | Housing | Cable** | Supply Power | Output Type |
|-----------------------|----------------|----------------|-----------------|-------------------------|--|------------------------------|
| A | B | C | | | | |
| Emitter Models | | | | | | |
| SMA30PEL | SMA30PELB | SMA30PELC | Plastic | 2 m (6.5') 2-wire Cable | Universal: 12 to 240V ac, 10 to 30V dc | - |
| SMA30PELQD | SMA30PELQDB | SMA30PELQDC | | 3-pin Mini-style QD† | | |
| SMA30SEL | SMA30SELB | SMA30SELC | Stainless Steel | 2 m (6.5') 3-wire Cable | | |
| SMA30SELQD | SMA30SELQDB | SMA30SELQDC | | 3-pin Mini-style QD† | | |
| DC Receivers | | | | | | |
| SM30PRL | SM30PRLB | SM30PRLC | Plastic | 2 m (6.5') 4-wire Cable | 10 to 30V dc | Bi-Modal™ NPN or PNP |
| SM30PRLQD | SM30PRLQDB | SM30PRLQDC | | 4-pin Mini-style QD | | |
| SM30SRL | SM30SRLB | SM30SRLC | Stainless Steel | 2 m (6.5') 4-wire Cable | | |
| SM30SRLQD | SM30SRLQDB | SM30SRLQDC | | 4-pin Mini-style QD | | |
| AC Receivers | | | | | | |
| SM2A30PRL | SM2A30PRLB | SM2A30PRLC | Plastic | 2 m (6.5') 2-wire Cable | 24 to 240V ac | SPST Solid-state, L.O. |
| SM2A30PRLQD | SM2A30PRLQDB | SM2A30PRLQDC | | 3-pin Mini-style QD† | | |
| SM2A30SRL | SM2A30SRLB | SM2A30SRLC | Stainless Steel | 2 m (6.5') 3-wire Cable | | |
| SM2A30SRLQD | SM2A30SRLQDB | SM2A30SRLQDC | | 3-pin Mini-style QD† | | |
| SM2A30PRLNC | SM2A30PRLNCB | SM2A30PRLNCC | Plastic | 2 m (6.5') 2-wire Cable | | SPST Solid-state, D.O. |
| SM2A30PRLNCQD | SM2A30PRLNCQDB | SM2A30PRLNCQDC | | 3-pin Mini-style QD† | | |
| SM2A30SRLNC | SM2A30SRLNCB | SM2A30SRLNCC | Stainless Steel | 2 m (6.5') 3-wire Cable | | |
| SM2A30SRLNCQD | SM2A30SRLNCQDB | SM2A30SRLNCQDC | | 3-pin Mini-style QD† | | |

* Any emitter and receiver shown here can be used together, if they have the same modulation frequency.


** Standard 2 m (6.5 ft) cable and integral QD models are listed. A model with a QD connector requires a mating cable; see page 4. To order the 9 m (30 ft) cable: add suffix “W/30” following the Frequency suffix of any cable model (e.g., SM30PRLBW/30).

† AC models with QD require SM30CC model cables; see page 4.

⚠ WARNING . . . Not To Be Used for Personnel Protection

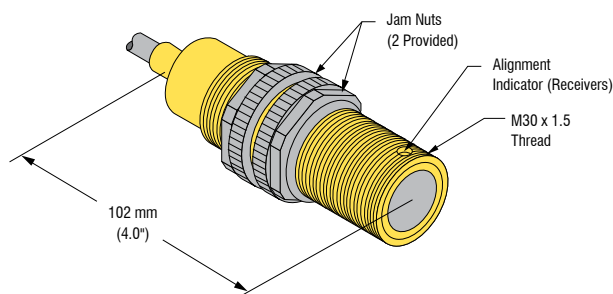
Never use these products for personnel protection. Doing so could lead to serious injury or death. These devices do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A device failure or malfunction can cause either an energized or de-energized output condition. Consult your current Banner Safety Products catalog for safety products that meet OSHA, ANSI, and IEC standards for personnel protection.

Specifications

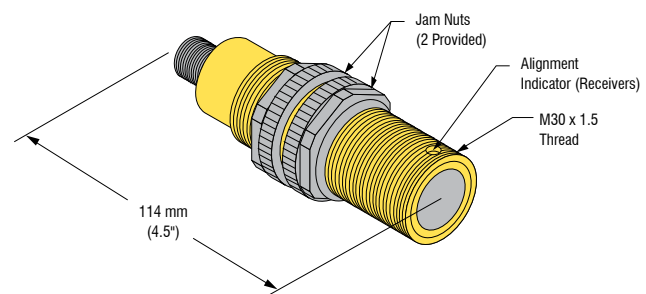
| | |
|------------------------------------|--|
| Supply Voltage and Current | Emitters: 12 to 240V ac (50/60 Hz) or 10-30V dc at 20 mA, 10% maximum ripple DC Receivers: 10 to 30V dc at 10 mA maximum (exclusive of load); 10% maximum ripple AC Receivers: 24 to 240V ac (50/60 Hz) |
| Supply Protection Circuitry | Protected against reverse polarity and transient voltages |
| Output Configuration | DC Receivers: Bi-Modal™ output (PNP sourcing or NPN sinking). Selection of light/dark operate and sourcing or sinking configuration dependent on hookup. AC Receivers: SPST solid-state switch; light operate (LO) or dark operate (DO) dependent on model. |
| Output Rating | DC Receivers: 250 mA continuous Output saturation voltage (PNP & NPN configuration) < 1 volt at 10 mA and < 2 volts at 250 mA Off-state leakage current < 10 microamps AC Receivers: Maximum steady-state load capability is 500 mA Inrush capability: 10 amps for 1 second (non-repeating) Off-state leakage: current < 1.7 mA rms On-state voltage drop: < 3.5 volts rms across a 500 mA load; < 5 volts rms across a 15 mA load |
| Output Protection Circuitry | Outputs of dc receivers are short circuit protected |
| Output Response Time | 10 milliseconds on/off |
| Repeatability | "A" frequency models: 1 ms "B" frequency models: 1.5 ms "C" frequency models: 2.3 ms |
| Indicators | Internal red LED, visible through the lens or from side of the sensor. Emitters: Red "Power ON" indicator LED DC Receivers: Lights whenever receiver sees its modulated light source AC Receivers: Lights whenever receiver's output is conducting |
| Construction | Fully epoxy-encapsulated tubular threaded housing, positive sealed at both ends, quad-ring sealed acrylic lens. Plastic models: 30 mm diameter thermoplastic polyester housing and jam nuts. Stainless Steel models: 30 mm diameter 303 stainless steel housing and jam nuts. |
| Environmental Rating | Exceeds NEMA 6P and IEC IP67 standards |
| Connections | PVC-jacketed 2 m or 9 m cables or Mini-style quick-disconnect (QD) fitting are available. QD cables are ordered separately. See page 4. |
| Operating Conditions | Temperature: -40° to +70° C (-40° to +158° F) Relative humidity: 90% at 50° C (non-condensing) |
| Certifications |  |

Dimensions

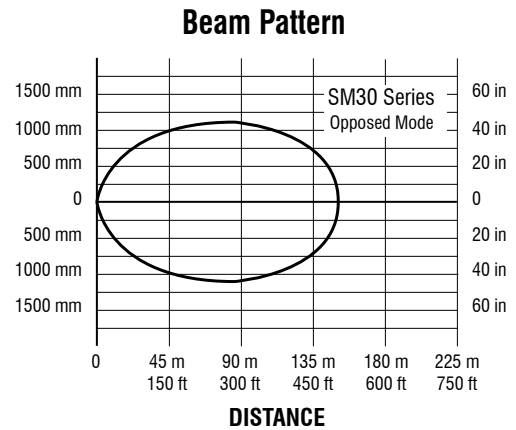
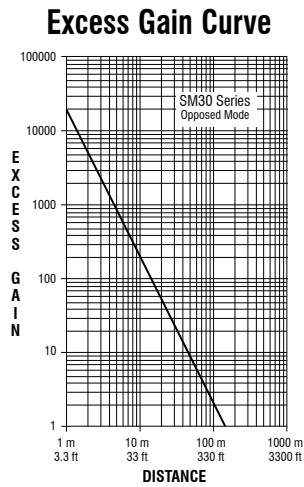
Cabled Models



QD Models

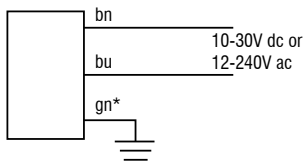


Performance Curves

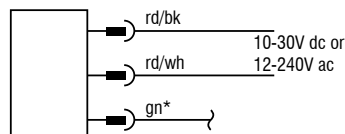


Hookups

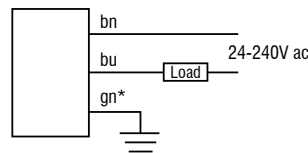
Emitters – Cabled



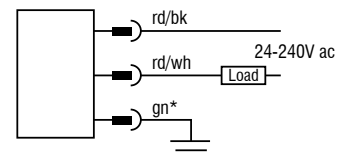
Emitters – QD



AC Receivers – Cabled



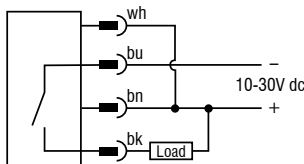
AC Receivers – QD



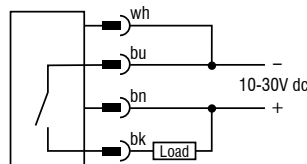
NOTE: AC emitters are not polarity-sensitive when powered by dc voltage. For QD emitters, use SM30CC model cables listed on page 4 in order to match cable colors.

*Connect green wire to earth ground whenever a stainless steel model is powered by ac voltage. (Cabled plastic models have no green wire.)

DC Receivers – NPN

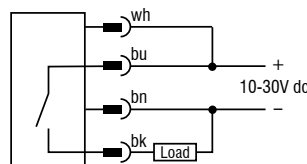


Light Operate

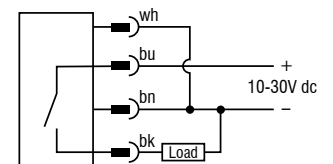


Dark Operate

DC Receivers – PNP



Light Operate



Dark Operate

NOTE: Where QD hookups only are shown, cabled model hookups are functionally identical.

Quick-Disconnect (QD) Cables

| Style | Model | Length | Connector | Use with | Pinout |
|------------------|---|--------------------------------------|-----------|------------------------------|--------|
| 3-pin Mini-Style | SM30CC-306 SM30CC-312 | 2 m (6.5') 4 m (12') | Straight | Emitters and AC receivers | |
| 4-pin Mini-Style | MBCC-406 MBCC-412 MBCC-430 | 2 m (6.5') 4 m (12') 9 m (30') | | DC receivers | |

Apertures

| Model | Description | | |
|---------------|--|--|--|
| APG30S | Kit includes: a thread-on stainless steel housing, a flat glass lens, two quad-ring seals, plus 3 round and 3 slotted aperture disks | | |

Mounting Brackets

| | | |
|--|----------------|---|
| | SMB30A | <ul style="list-style-type: none"> • 30 mm, 12-gauge, stainless steel, right-angle bracket with a curved mounting slot for versatile orientation • Clearance for M6 (1/4") hardware |
| | SMB30C | <ul style="list-style-type: none"> • 30 mm split clamp bracket • Black reinforced thermoplastic polyester • Includes stainless steel mounting hardware |
| | SMB30MM | <ul style="list-style-type: none"> • 30 mm, 12-gauge, stainless steel, right-angle bracket with curved mounting slots for versatile orientation • Clearance for M6 (1/4") hardware |
| | SMB30SC | <ul style="list-style-type: none"> • 30 mm swivel bracket • Black reinforced thermoplastic polyester • Includes stainless steel mounting and swivel locking hardware |



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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 of the Banner product.

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- Modulation frequency “A” is standard; frequencies “B” and “C” also available for preventing crosstalk in multiple-sensor applications (emitter and opposed receiver frequencies must match)
- AC- and DC-operated receiver models available; emitters feature Universal voltage
- Range for all models: 150 m (500 ft). See page 3 for performance curves.

| Modulation Frequency* | | | Housing | Cable** | Supply Power | Output Type |
|-----------------------|----------------|----------------|-----------------|-------------------------|--|------------------------------|
| A | B | C | | | | |
| Emitter Models | | | | | | |
| SMA30PEL | SMA30PELB | SMA30PELC | Plastic | 2 m (6.5') 2-wire Cable | Universal: 12 to 240V ac, 10 to 30V dc | – |
| SMA30PELQD | SMA30PELQDB | SMA30PELQDC | | 3-pin Mini-style QD† | | |
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| SMA30SELQD | SMA30SELQDB | SMA30SELQDC | | 3-pin Mini-style QD† | | |
| DC Receivers | | | | | | |
| SM30PRL | SM30PRLB | SM30PRLC | Plastic | 2 m (6.5') 4-wire Cable | 10 to 30V dc | Bi-Modal™ NPN or PNP |
| SM30PRLQD | SM30PRLQDB | SM30PRLQDC | | 4-pin Mini-style QD | | |
| SM30SRL | SM30SRLB | SM30SRLC | Stainless Steel | 2 m (6.5') 4-wire Cable | | |
| SM30SRLQD | SM30SRLQDB | SM30SRLQDC | | 4-pin Mini-style QD | | |
| AC Receivers | | | | | | |
| SM2A30PRL | SM2A30PRLB | SM2A30PRLC | Plastic | 2 m (6.5') 2-wire Cable | 24 to 240V ac | SPST Solid-state, L.O. |
| SM2A30PRLQD | SM2A30PRLQDB | SM2A30PRLQDC | | 3-pin Mini-style QD† | | |
| SM2A30SRL | SM2A30SRLB | SM2A30SRLC | Stainless Steel | 2 m (6.5') 3-wire Cable | | |
| SM2A30SRLQD | SM2A30SRLQDB | SM2A30SRLQDC | | 3-pin Mini-style QD† | | |
| SM2A30PRLNC | SM2A30PRLNCB | SM2A30PRLNCC | Plastic | 2 m (6.5') 2-wire Cable | | SPST Solid-state, D.O. |
| SM2A30PRLNCQD | SM2A30PRLNCQDB | SM2A30PRLNCQDC | | 3-pin Mini-style QD† | | |
| SM2A30SRLNC | SM2A30SRLNCB | SM2A30SRLNCC | Stainless Steel | 2 m (6.5') 3-wire Cable | | |
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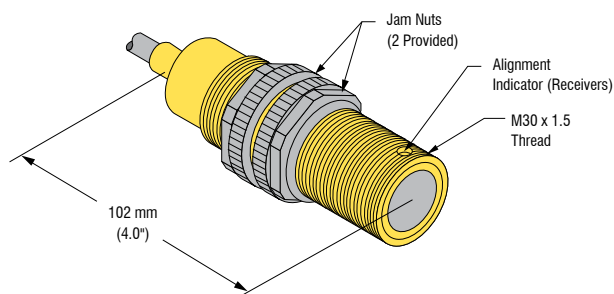
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Specifications

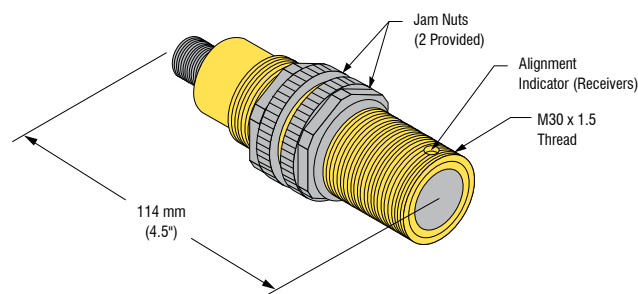
| | |
|------------------------------------|--|
| Supply Voltage and Current | Emitters: 12 to 240V ac (50/60 Hz) or 10-30V dc at 20 mA, 10% maximum ripple DC Receivers: 10 to 30V dc at 10 mA maximum (exclusive of load); 10% maximum ripple AC Receivers: 24 to 240V ac (50/60 Hz) |
| Supply Protection Circuitry | Protected against reverse polarity and transient voltages |
| Output Configuration | DC Receivers: Bi-Modal™ output (PNP sourcing or NPN sinking). Selection of light/dark operate and sourcing or sinking configuration dependent on hookup. AC Receivers: SPST solid-state switch; light operate (LO) or dark operate (DO) dependent on model. |
| Output Rating | DC Receivers: 250 mA continuous Output saturation voltage (PNP & NPN configuration) < 1 volt at 10 mA and < 2 volts at 250 mA Off-state leakage current < 10 microamps AC Receivers: Maximum steady-state load capability is 500 mA Inrush capability: 10 amps for 1 second (non-repeating) Off-state leakage: current < 1.7 mA rms On-state voltage drop: < 3.5 volts rms across a 500 mA load; < 5 volts rms across a 15 mA load |
| Output Protection Circuitry | Outputs of dc receivers are short circuit protected |
| Output Response Time | 10 milliseconds on/off |
| Repeatability | "A" frequency models: 1 ms "B" frequency models: 1.5 ms "C" frequency models: 2.3 ms |
| Indicators | Internal red LED, visible through the lens or from side of the sensor. Emitters: Red "Power ON" indicator LED DC Receivers: Lights whenever receiver sees its modulated light source AC Receivers: Lights whenever receiver's output is conducting |
| Construction | Fully epoxy-encapsulated tubular threaded housing, positive sealed at both ends, quad-ring sealed acrylic lens. Plastic models: 30 mm diameter thermoplastic polyester housing and jam nuts. Stainless Steel models: 30 mm diameter 303 stainless steel housing and jam nuts. |
| Environmental Rating | Exceeds NEMA 6P and IEC IP67 standards |
| Connections | PVC-jacketed 2 m or 9 m cables or Mini-style quick-disconnect (QD) fitting are available. QD cables are ordered separately. See page 4. |
| Operating Conditions | Temperature: -40° to +70° C (-40° to +158° F) Relative humidity: 90% at 50° C (non-condensing) |
| Certifications |  |

Dimensions

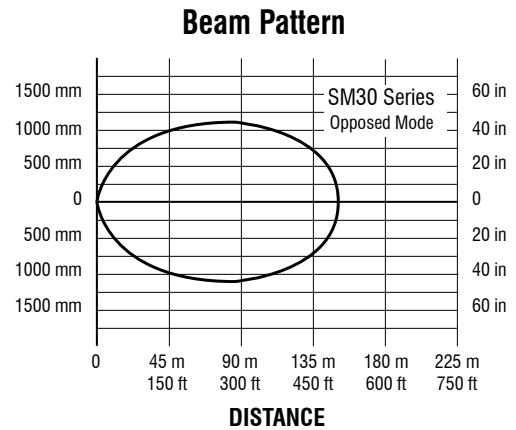
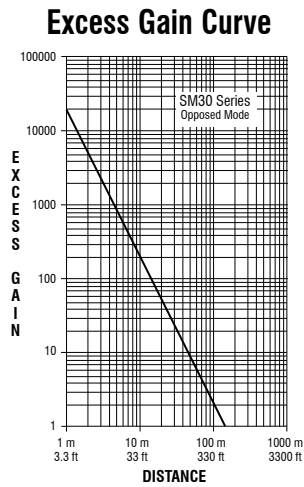
Cabled Models



QD Models

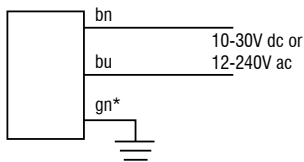


Performance Curves

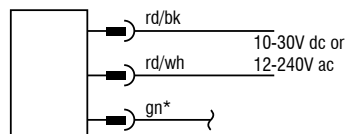


Hookups

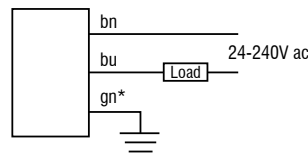
Emitters – Cabled



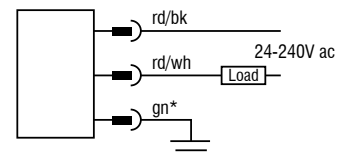
Emitters – QD



AC Receivers – Cabled



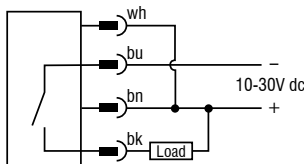
AC Receivers – QD



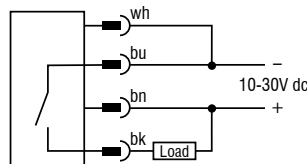
NOTE: AC emitters are not polarity-sensitive when powered by dc voltage. For QD emitters, use SM30CC model cables listed on page 4 in order to match cable colors.

*Connect green wire to earth ground whenever a stainless steel model is powered by ac voltage. (Cabled plastic models have no green wire.)

DC Receivers – NPN

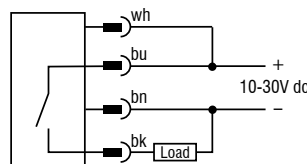


Light Operate

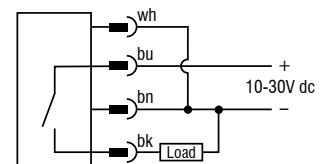


Dark Operate

DC Receivers – PNP



Light Operate



Dark Operate

NOTE: Where QD hookups only are shown, cabled model hookups are functionally identical.

Quick-Disconnect (QD) Cables

| Style | Model | Length | Connector | Use with | Pinout |
|------------------|---|--------------------------------------|-----------|------------------------------|--------|
| 3-pin Mini-Style | SM30CC-306 SM30CC-312 | 2 m (6.5') 4 m (12') | Straight | Emitters and AC receivers | |
| 4-pin Mini-Style | MBCC-406 MBCC-412 MBCC-430 | 2 m (6.5') 4 m (12') 9 m (30') | | DC receivers | |

Apertures

| Model | Description | | |
|---------------|--|--|--|
| APG30S | Kit includes: a thread-on stainless steel housing, a flat glass lens, two quad-ring seals, plus 3 round and 3 slotted aperture disks | | |

Mounting Brackets

| | | |
|--|----------------|---|
| | SMB30A | <ul style="list-style-type: none"> • 30 mm, 12-gauge, stainless steel, right-angle bracket with a curved mounting slot for versatile orientation • Clearance for M6 (1/4") hardware |
| | SMB30C | <ul style="list-style-type: none"> • 30 mm split clamp bracket • Black reinforced thermoplastic polyester • Includes stainless steel mounting hardware |
| | SMB30MM | <ul style="list-style-type: none"> • 30 mm, 12-gauge, stainless steel, right-angle bracket with curved mounting slots for versatile orientation • Clearance for M6 (1/4") hardware |
| | SMB30SC | <ul style="list-style-type: none"> • 30 mm swivel bracket • Black reinforced thermoplastic polyester • Includes stainless steel mounting and swivel locking hardware |



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