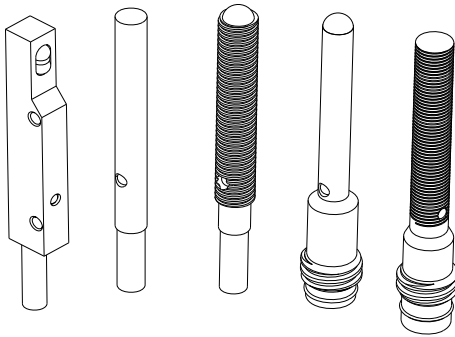


Datasheet

Miniature self-contained sensors in stainless steel housing



- Tough - 300 series stainless steel body withstands a wide variety of chemicals and cutting fluids
- Tiny sensors are available as small as a 4 mm barrel (about the size of a single optical fiber assembly)
- Economical, self-contained sensors are available in diffuse or opposed sensing modes; no separate amplifier required
- Advanced optical design provides high performance, and very repeatable sensing
- Well-focused, narrow beam allows the entire barrel sensor to be recessed into fixtures (excluding 50 mm range models)
- Smooth, stainless steel barrel is perfect for hygienic applications that require routine cleaning
- A choice of threaded or smooth barrel housings or flat-pack side-looking housing



WARNING: Not To Be Used for Personnel Protection

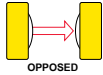
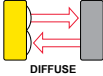
Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

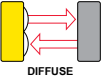
Models

| Housing Style: 4 mm Smooth Barrel | | | | | |
|-----------------------------------|---------------|----------------|---------------------------------------|--|---------------|
| NPN Models | PNP Models | Sensing Mode | Range ¹ | Output Type | Connection |
| VSM46E Emitter | | <p>OPPOSED</p> | 250 mm (9.84 in) | — | 2 m (6.6 ft) |
| VSM46EQ7 Emitter | | | | | 3-Pin Pico QD |
| VSM4RN6R | VSM4RP6R | | | DO | 2 m (6.6 ft) |
| VSM4RN6RQ7 | VSM4RP6RQ7 | | | | 3-Pin Pico QD |
| VSM4AN6CV10 | VSM4AP6CV10 | <p>DIFFUSE</p> | 10 to 30 mm (0.39 to 1.18 in) typical | LO | 2 m (6.6 ft) |
| VSM4AN6CV10Q7 | VSM4AP6CV10Q7 | | | | 3-Pin Pico QD |
| VSM4AN6CV20 | VSM4AP6CV20 | | | | 2 m (6.6 ft) |
| VSM4AN6CV20Q7 | VSM4AP6CV20Q7 | | | | 3-Pin Pico QD |
| VSM4AN6CV50 | VSM4AP6CV50 | | | 50 to 140 mm (1.97 to 5.51 in) typical | 2 m (6.6 ft) |
| VSM4AN6CV50Q7 | VSM4AP6CV50Q7 | | | | 3-Pin Pico QD |

¹ Application Note: These sensors have a specified minimum detection range on a 90% reflectivity diffuse white card, but the maximum detection range varies with target reflectivity, target angle, and sensor tolerance. If reliable background suppression is required in your application, please contact Banner Engineering to specify a fixed-field or adjustable field sensor with background suppression technology.



| Housing Style: 5 mm Threaded Barrel | | | | | | |
|-------------------------------------|---------------|--|--|-------------|---|---------------|
| NPN Models | PNP Models | Sensing Mode | Range ² | Output Type | Connection | |
| VSM56E Emitter | |  OPPOSED | 250 mm (9.84 in) | — | 2 m (6.6 ft) | |
| VSM56EQ7 Emitter | | | | | 3-Pin Pico QD | |
| VSM5RN6R | VSM5RP6R | | | DO | 2 m (6.6 ft) | |
| VSM5RN6RQ7 | VSM5RP6RQ7 | | | | 3-Pin Pico QD | |
| VSM5AN6CV10 | VSM5AP6CV10 |  DIFFUSE | 10 to 30 mm (0.39 to 1.18 in) typical | LO | 2 m (6.6 ft) | |
| VSM5AN6CV10Q7 | VSM5AP6CV10Q7 | | | | 3-Pin Pico QD | |
| VSM5AN6CV20 | VSM5AP6CV20 | | | | 20 to 50 mm (0.79 to 1.97 in) typical | 2 m (6.6 ft) |
| VSM5AN6CV20Q7 | VSM5AP6CV20Q7 | | | | 3-Pin Pico QD | |
| VSM5AN6CV50 | VSM5AP6CV50 | | | | 50 to 140 mm (1.97 to 5.51 in) typical | 2 m (6.6 ft) |
| VSM5AN6CV50Q7 | VSM5AP6CV50Q7 | | | | | 3-Pin Pico QD |

| Housing Style: Flat-Pack Side-Looker | | | | | |
|--------------------------------------|-------------|--|---|-------------|--------------|
| NPN Models | PNP Models | Sensing Mode | Range ² | Output Type | Connection |
| VSMQAN6CV20 | VSMQAP6CV20 |  DIFFUSE | 20 to 50 mm (0.79 to 1.97 in) typical | LO | 2 m (6.6 ft) |
| VSMQAN6CV50 | VSMQAP6CV50 | | 50 to 140 mm (1.97 to 5.51 in) typical | | |
| VSMQAN6CV90 | VSMQAP6CV90 | | 90 to 200 mm (3.54 to 7.87 in) typical | | |

² Application Note: These sensors have a specified minimum detection range on a 90% reflectivity diffuse white card, but the maximum detection range varies with target reflectivity, target angle, and sensor tolerance. If reliable background suppression is required in your application, please contact Banner Engineering to specify a fixed-field or adjustable field sensor with background suppression technology.

Specifications

Supply Voltage and Current

10 to 30 V dc (10% maximum ripple)

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Output Configuration

Single-output: 1 NPN or 1 PNP; light operate (LO) or dark operate (DO), depending on model

Output Rating

100 mA max

OFF-state leakage current: less than 1 μ A

ON-state saturation voltage: less than 2 V at 100 mA

Required Overcurrent Protection



WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to <http://www.bannerengineering.com>.

| Supply Wiring (AWG) | Required Overcurrent Protection (Amps) |
|---------------------|--|
| 20 | 5.0 |
| 22 | 3.0 |
| 24 | 2.0 |
| 26 | 1.0 |
| 28 | 0.8 |
| 30 | 0.5 |

Output Protection Circuitry

Protected against false power-up and continuous overload or short circuit of outputs

Overload trip point \geq 100 mA

Response Time

2.5 milliseconds

Delay at Power-Up

20 milliseconds

Repeatability

1 millisecond

Indicators

Yellow LED: light sensed

Construction

300 series stainless steel with PVC cable

CV10, CV20: sapphire lens

CV50, emitter and receiver: glass lens

Environmental Rating

IP67

Connection

2 m PVC-jacketed cable or 3-pin Pico-style integral QD (Q7), depending on model.

Operating Conditions

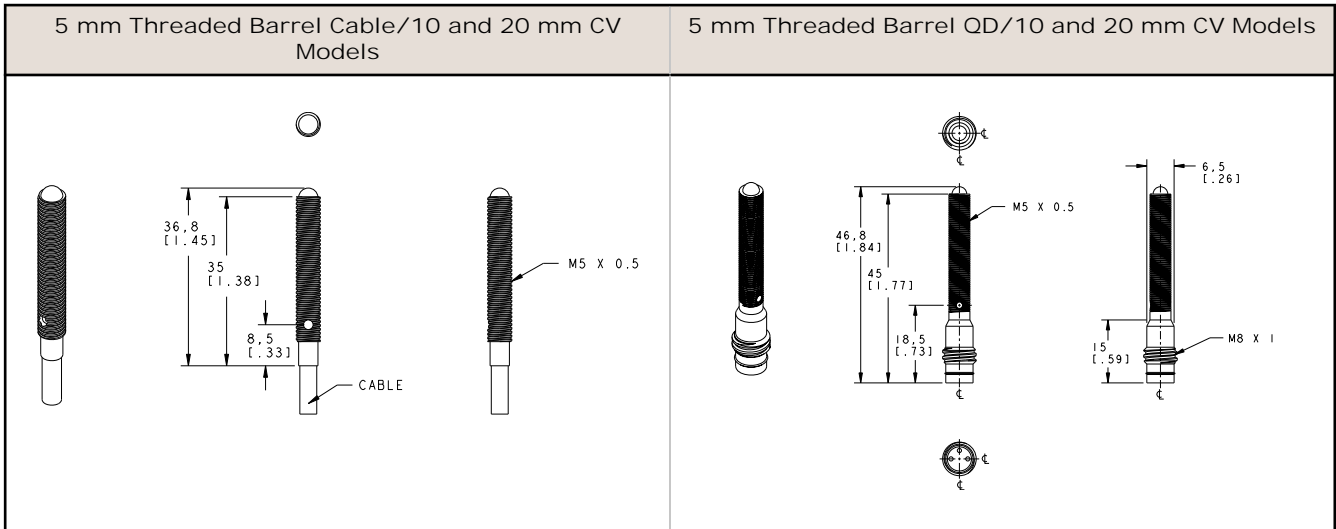
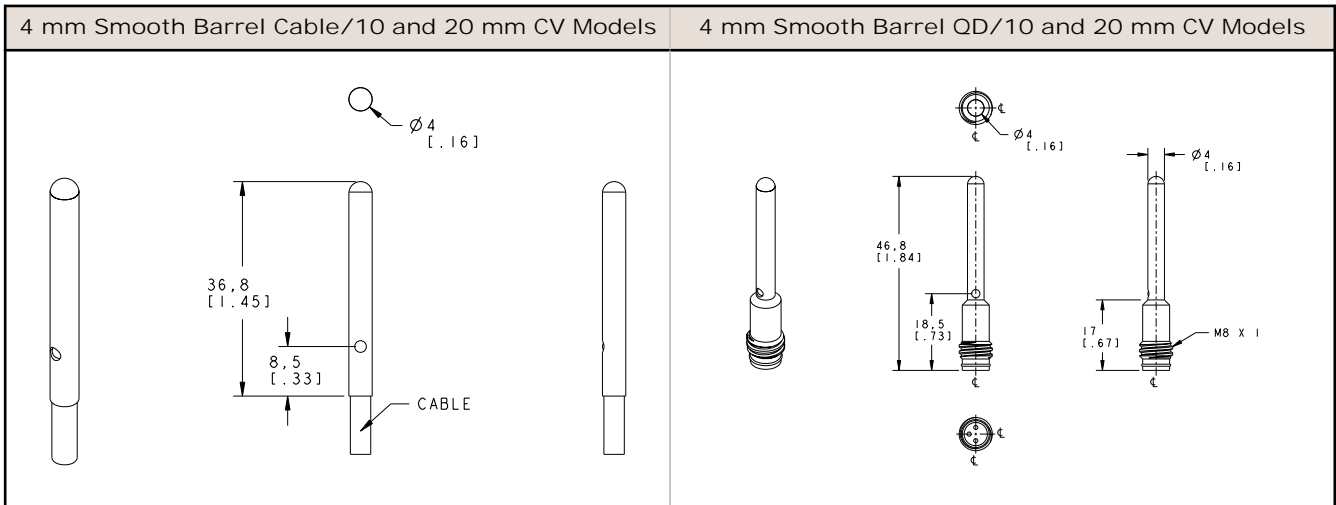
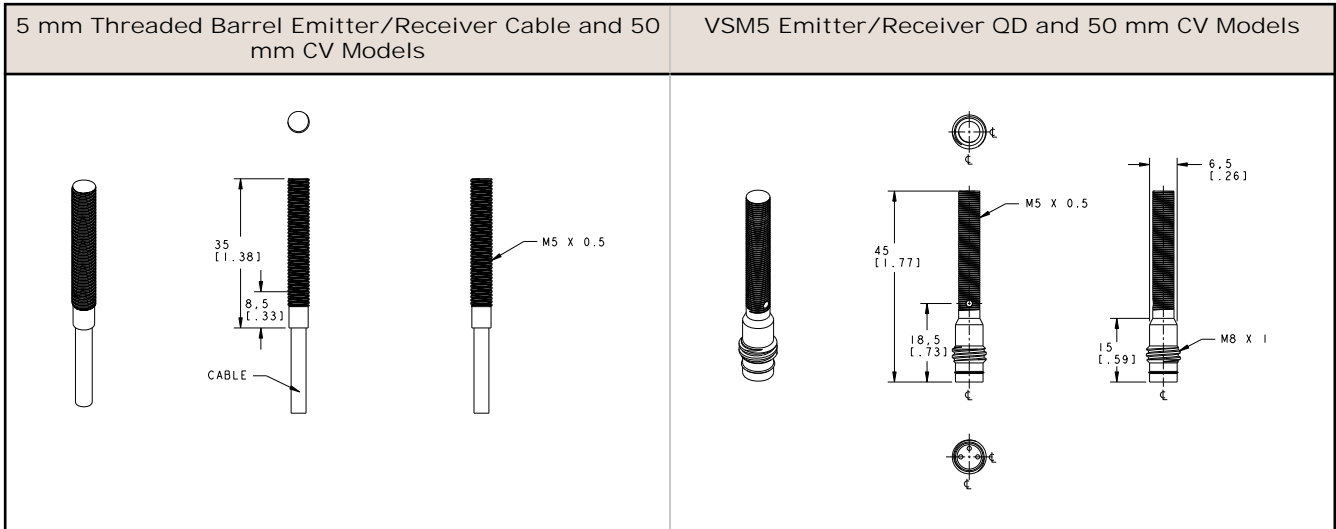
Temperature: 0 °C to +55 °C (+32 °F to +131 °F)

Certifications

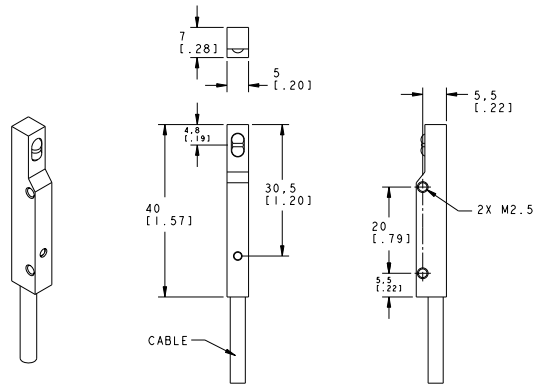


Dimensions

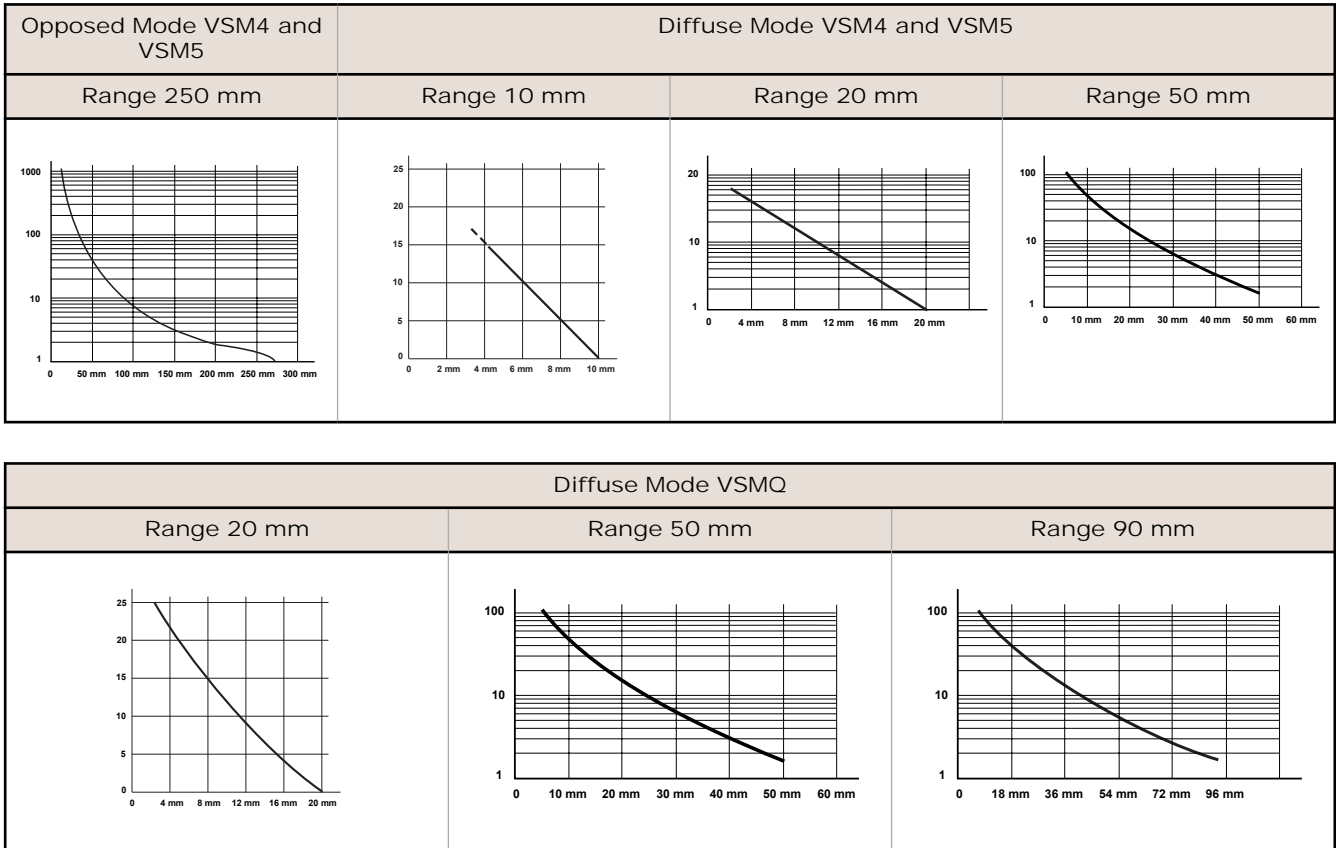
| 4 mm Smooth Barrel Emitter/Receiver Cable and 50 mm CV Models | 4 mm Smooth Barrel Emitter/Receiver QD and 50 mm CV Models |
|---|--|
| | |



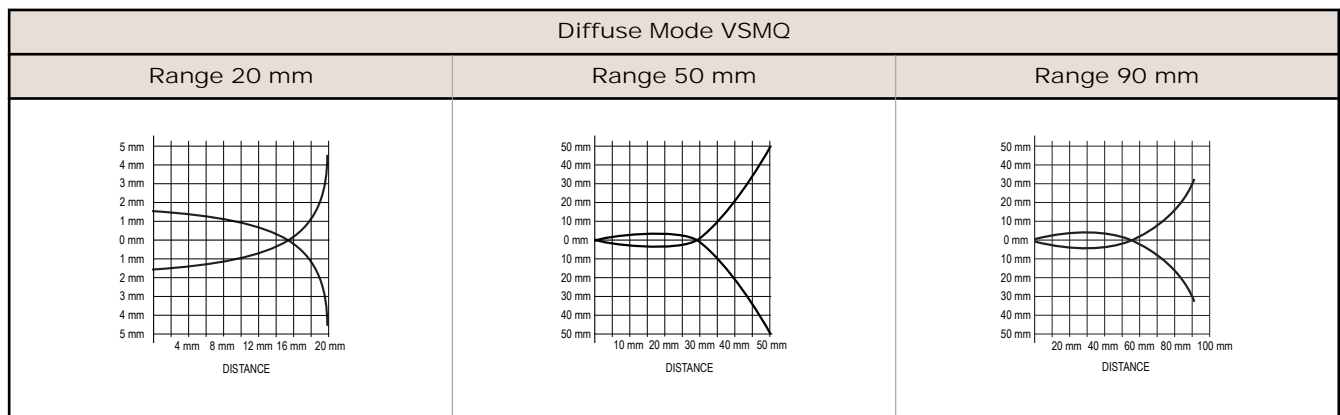
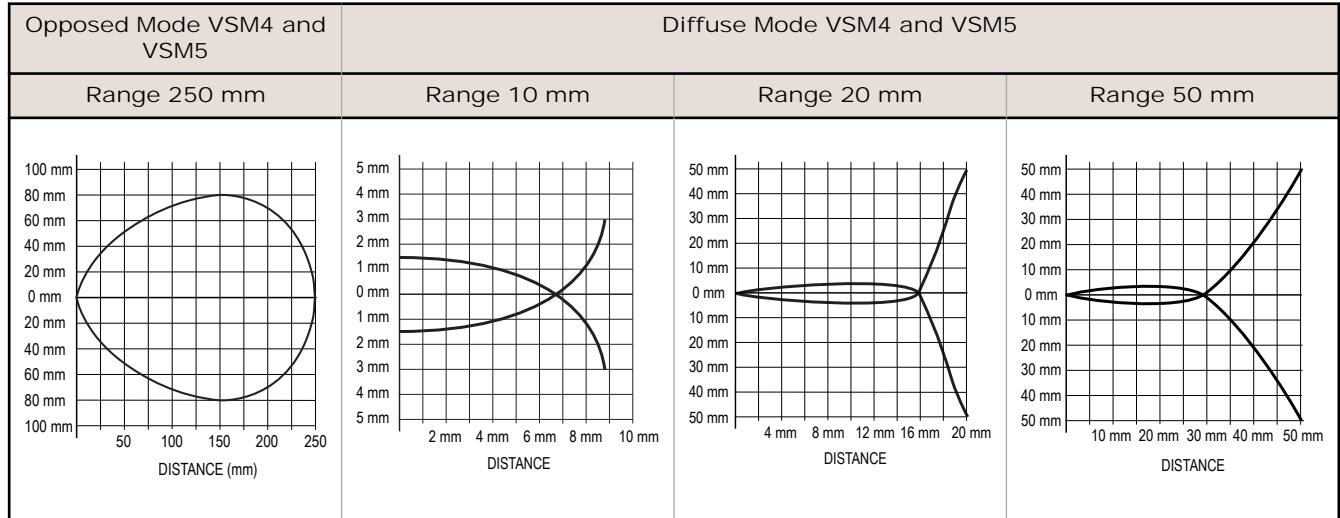
Flat-Pack Side-Looker



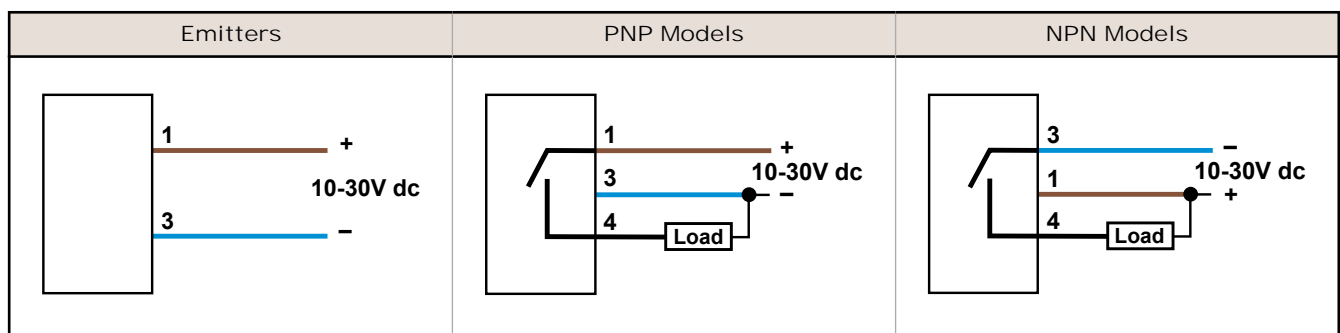
Excess Gain Curves



Beam Patterns

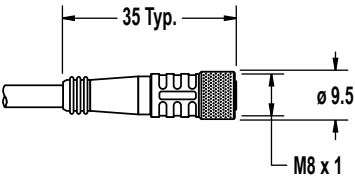
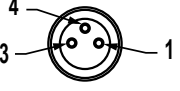
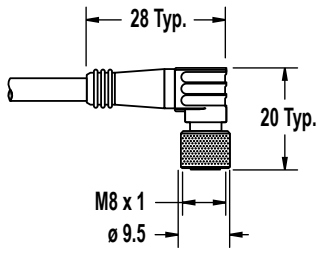


Wiring



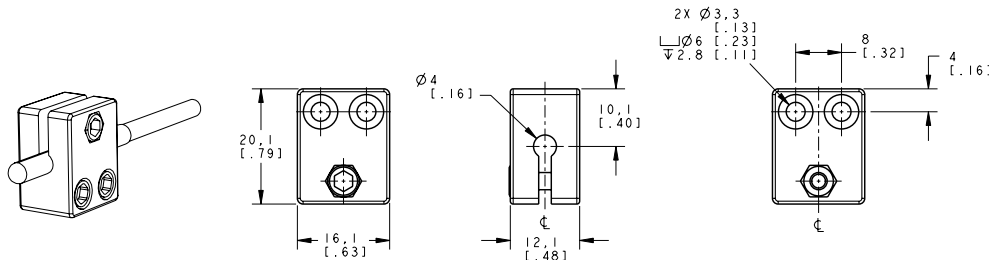
Accessories

Cordsets

| 3-Pin Threaded M8/Pico-Style Cordsets | | | | |
|---------------------------------------|-----------------|-------------|--|---|
| Model | Length | Style | Dimensions | Pinout |
| PKG3M-2 | 2 m (6.56 ft) | Straight |  |  <p>1 = Brown 3 = Blue 4 = Black</p> |
| PKG3M-5 | 5 m (16.40 ft) | | | |
| PKG3M-7 | 7 m (22.97 ft) | | | |
| PKG3M-9 | 9 m (29.53 ft) | | | |
| PKG3M-10 | 10 m (32.81 ft) | | | |
| PKW3M-2 | 2 m (6.56 ft) | Right-Angle |  | |
| PKW3M-5 | 5 m (16.40 ft) | | | |
| PKW3M-9 | 9 m (29.53 ft) | | | |

Brackets

SMBVSM4



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