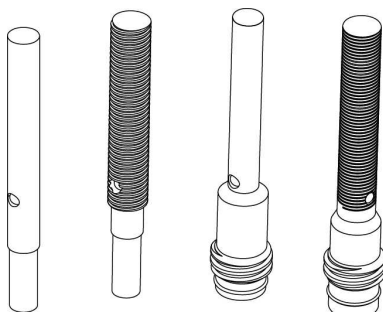


VSM-2 Series Micro Sensor



Datasheet

Miniature self-contained sensor in a stainless steel housing



- Available with 4 mm diameter smooth barrel or 5 mm threaded barrel for mounting in the smallest spaces
- Diffuse and opposed mode sensing options to meet a wide variety of application requirements
- IO-Link communication for remote configuration and monitoring, simple device replacement, and advanced diagnostics
- Visible red beam for easy alignment
- Dual color LED indicator for clear visualization of sensor status
- Focused beam allows for reliable presence detection even when the sensor is fully embedded within the machine



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 with a 4 mm Smooth Barrel

Opposed Mode Models must be purchased in pairs: one emitter and one receiver					
NPN Models	PNP Models with IO-Link	Emitter Models	Range	Output Type	Connection
VSM-2S4RNR500-2M	VSM-2S4RPR500-2M	VSM-2S4NAEL-2M	0 to 500 mm (0 to 19.7 in)	DO	2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2S4RNR500-Q3	VSM-2S4RPR500-Q3	VSM-2S4NAEL-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2S4RNR500-Q7	VSM-2S4RPR500-Q7	VSM-2S4NAEL-Q7			Integral 3-pin M8/Pico-style quick disconnect

Diffuse Mode Models				
NPN Models	PNP Models with IO-Link	Range	Output Type	Connection
VSM-2S4AND10-2M	VSM-2S4APD10-2M	0 to 10 mm (0 to 0.39 in)	LO	2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2S4AND10-Q3	VSM-2S4APD10-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2S4AND10-Q7	VSM-2S4APD10-Q7			Integral 3-pin M8/Pico-style quick disconnect
VSM-2S4AND20-2M	VSM-2S4APD20-2M	0 to 20 mm (0 to 0.79 in)		2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2S4AND20-Q3	VSM-2S4APD20-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2S4AND20-Q7	VSM-2S4APD20-Q7			Integral 3-pin M8/Pico-style quick disconnect
VSM-2S4AND50-2M	VSM-2S4APD50-2M	0 to 50 mm (0 to 2 in)		2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2S4AND50-Q3	VSM-2S4APD50-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2S4AND50-Q7	VSM-2S4APD50-Q7			Integral 3-pin M8/Pico-style quick disconnect

Models with a 5 mm Threaded Barrel

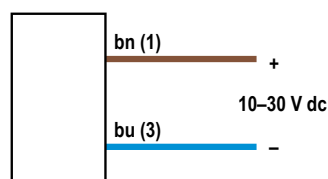
Opposed Mode Models must be purchased in pairs: one emitter and one receiver					
NPN Models	PNP Models with IO-Link	Emitter Models	Range	Output Type	Connection
VSM-2M5RNR500-2M	VSM-2M5RPR500-2M	VSM-2M5NAEL-2M	0 to 500 mm (0 to 19.7 in)	DO	2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2M5RNR500-Q3	VSM-2M5RPR500-Q3	VSM-2M5NAEL-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2M5RNR500-Q7	VSM-2M5RPR500-Q7	VSM-2M5NAEL-Q7			Integral 3-pin M8/Pico-style quick disconnect



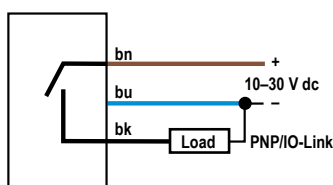
Diffuse Mode Models				
NPN Models	PNP Models with IO-Link	Range	Output Type	Connection
VSM-2M5AND10-2M	VSM-2M5APD10-2M	0 to 10 mm (0 to 0.39 in)	LO	2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2M5AND10-Q3	VSM-2M5APD10-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2M5AND10-Q7	VSM-2M5APD10-Q7			Integral 3-pin M8/Pico-style quick disconnect
VSM-2M5AND20-2M	VSM-2M5APD20-2M	0 to 20 mm (0 to 0.79 in)		2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2M5AND20-Q3	VSM-2M5APD20-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2M5AND20-Q7	VSM-2M5APD20-Q7			Integral 3-pin M8/Pico-style quick disconnect
VSM-2M5AND50-2M	VSM-2M5APD50-2M	0 to 50 mm (0 to 2 in)		2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable
VSM-2M5AND50-Q3	VSM-2M5APD50-Q3			150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect
VSM-2M5AND50-Q7	VSM-2M5APD50-Q7			Integral 3-pin M8/Pico-style quick disconnect

Wiring

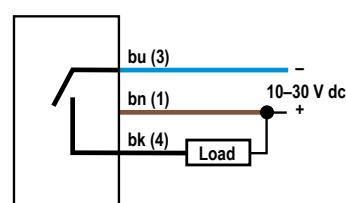
Emitters



PNP/IO-Link Models



NPN Models



Integral 3-pin M8/Pico-style quick disconnect (male) Models



Key

- 1 - Brown
- 3 - Blue
- 4 - Black

Specifications

Supply Voltage and Current

- 10 to 30 V dc (10% maximum ripple)
- Less than 12 mA consumption without load

Supply Protection Circuitry

- Protected against reverse polarity and transient voltages

Output Configuration

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

Output Rating

- Current: Less than 100 mA
- PNP On Voltage: Supply voltage – 2 V
- PNP Off Voltage: Approximately 0 V
- NPN On Voltage: Supply voltage
- NPN Off Voltage: < 2.0 V

Output Protection Circuitry

- Protected against false power-up and continuous overload or short circuit of outputs
- Overload trip point ≥ 100 mA

Light Source

- Opposed, Diffuse: 630 nm red LED

Response Time

- Normal Mode: Less than 500 μ s (default)
- Fine Mode: Less than 1 ms (selectable via IO-Link)
- Fast Mode: Less than 200 μ s (selectable via IO-Link)

Switching Frequency

- Normal Mode: Less than 1 kHz (default)
- Fine Mode: Less than 500 Hz (selectable via IO-Link)
- Fast Mode: Less than 2.5 kHz (selectable via IO-Link)

Delay at Power-Up

- 20 milliseconds

Repeatability

- 1 millisecond

Indicators

- Green LED: Output is conducting
- Amber LED: Marginal signal

Light Spot Size

- Diffuse: 5 mm dia (at 10 mm), 8 mm (at 20 mm), and 20 mm (at 50 mm)
- Opposed: 50 mm dia (at 200 mm)

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 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

Construction

V2A stainless steel with PUR cable; PBT/PMMA optics

Environmental Rating

IEC IP67

Connection

2 m (6.5 ft) unterminated 3-wire PUR-jacketed cable; 150 mm (6 in) PUR cable with a 3-pin M8/Pico-style quick disconnect; or Integral 3-pin M8/Pico-style quick disconnect, depending on the model

Operating Conditions

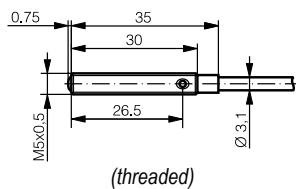
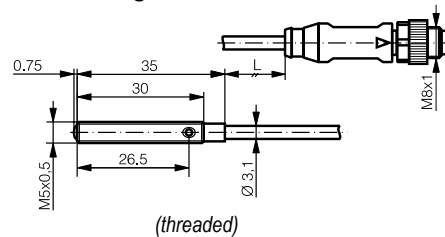
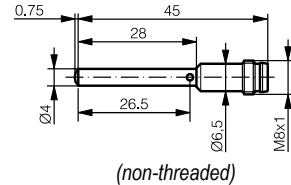
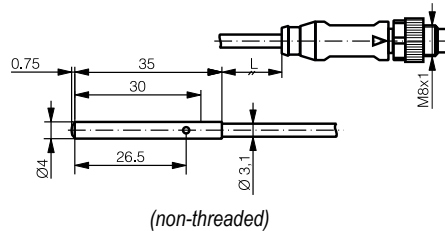
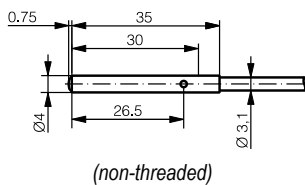
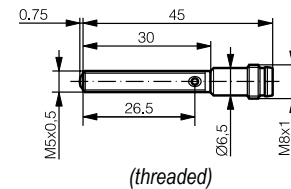
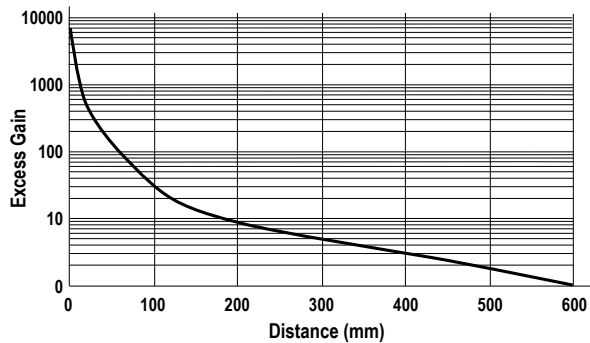
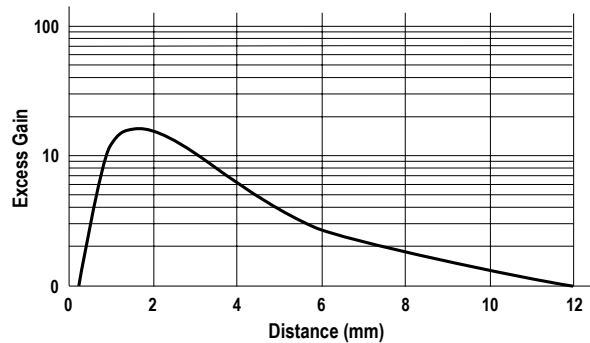
-25 °C to +65 °C (-13 °F to +149 °F)

Vibration and Mechanical Shock

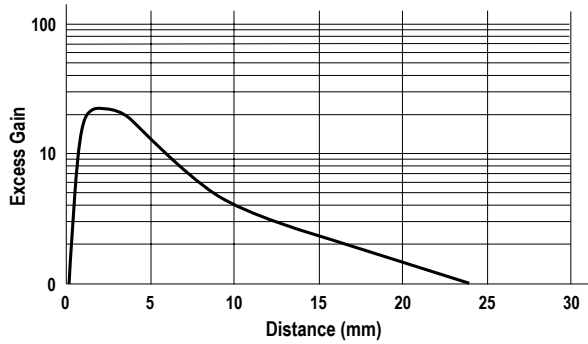
IEC 60947-5-2

Certifications**Dimensions**

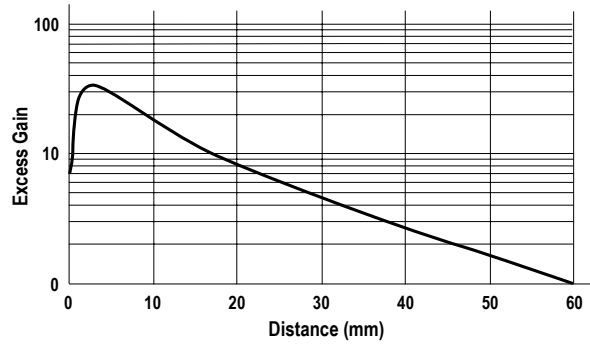
All measurements are listed in millimeters, unless noted otherwise.

Cable Models**Pigtail Models****Connector Models****Performance Curves****Opposed Models****Diffuse, 10 mm Range Models**

Diffuse, 20 mm Range Models



Diffuse, 50 mm Range Models



Accessories

Brackets

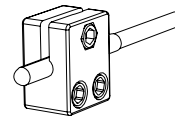
All measurements are listed in millimeters, unless noted otherwise.

SMBVSM4

- Mounting clamp for 4 mm barrel-style sensors
- Black impact-resistant plastic

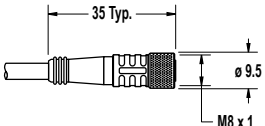

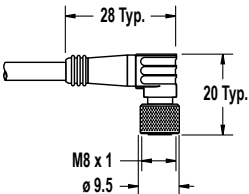
Hole center spacing: A = 8.0

Hole size: A = ϕ 3.3



Cordsets

All measurements are listed in millimeters, unless noted otherwise.

3-Pin Threaded M8/Pico-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
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)			

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