Datasheet

Self-contained Miniature Sensors

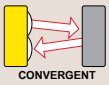


1. Power ON Indicator
2. Received Signal Indicator
3. 2 m Cable or 150 mm (6 inch) Quick-Disconnect

- 10 V to 30 V dc operation
- Visible red or infrared sensing beam, depending on model
- 10 mm (0.4 in) or 15 mm (0.6 in) convergent point, depending on model
- NPN (sinking) or PNP (sourcing) output, and dark or light operate, depending on model
- 3-wire connection; output load capacity to 50 mA
- Choice of integral cable or quick-disconnect connector

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.

Visible Red (860 nm) Beam Models 	Infrared (865 nm) Beam Models 	Focus	Output Type	Cable[1]
VS1AN5CV10	VS1AN5C10	10 mm (0.4 in)	NPN/LO	2 m (6.5 ft)
VS1RN5CV10	VS1RN5C10		NPN/DO	
VS1AP5CV10	VS1AP5C10		PNP/LO	
VS1RP5CV10	VS1RP5C10		PNP/DO	
VS1AN5CV20	VS1AN5C20	15 mm (0.6 in)	NPN/LO	
VS1RN5CV20	VS1RN5C20		NPN/DO	
VS1AP5CV20	VS1AP5C20		PNP/LO	
VS1RP5CV20	VS1RP5C20		PNP/DO	

Overview

VS1 Series miniature self-contained sensors are designed for precision sensing in small areas previously accessible only to remote or fiber optic models. Typical applications include mounting inside vibrating feeders and electronic component handling equipment, where larger sensors will not fit.

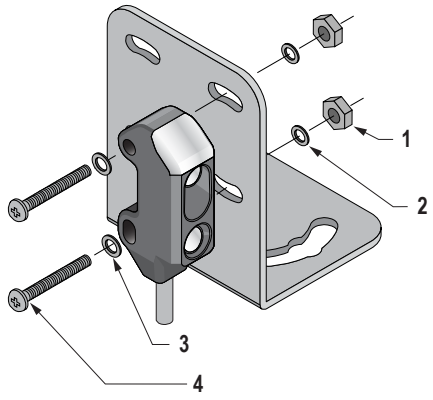
The sensing energy of a convergent-mode sensor is concentrated at the specified focus point. Convergent-mode sensors are less sensitive to background reflections, compared with diffuse-mode sensors. Contact the factory if background reflections are a problem.

[1]
- To order 9 m cables models, add suffix “W/30” to the model number (e.g., VS1AN5CV10 W/30).
- To order 150 mm (6 inch) cable with threaded 3-pin Pico-style quick disconnect fitting models, add suffix “Q” to the model number (e.g., VS1AN5CV10Q). A model with a QD connector requires a mating cable; see *Accessories* on page 4.

Installation Notes

Included with each sensor is a hardware packet containing two stainless steel M2 × 0.4 × 16 mm Phillips pan-head machine screws, flat washers, lock washers, and hex nuts. To mount the sensor, use the supplied flat washer against the front surface of the sensor housing, between it and the screw head. If mounting to one of the optional brackets, place the lock washer against the back of the bracket, followed by the nut. If mounting directly to a threaded hole, place the lock washer between the screw head and the flat washer.

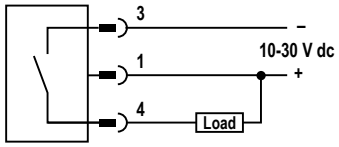
For best results, mount the VS1 where it is protected from moisture, high humidity and dirt.



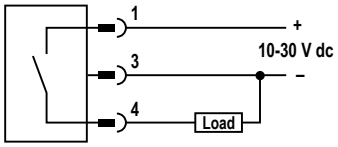
1. Hex Nut (2)
2. Lock Washer (2)
3. Washer (2)
4. M2 × 0.4 × 16 mm Phillips Pan-head Machine Screw (2)

Wiring Diagrams

NPN Outputs



PNP Outputs



Key:

1 = Brown
3 = Blue
4 = Black
X = Load

NOTE: QD hookups are shown. Cabled hookups are functionally identical.

Specifications

Supply Voltage and Current
10 V to 30 V dc (10% maximum ripple) at less than 25 mA (exclusive of load)

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Output Protection Circuitry
Protected against false pulse on power-up and continuous overload or short circuit of outputs. Overload trip point ≥ 100 mA.

Output Configuration
SPST solid-state switch
NPN (current sinking) or PNP (current sourcing), depending on model
Light operate (N.O.) or dark operate (N.C.), depending on model

Output Rating
50 mA maximum
OFF-state leakage current: < 1 microamp at 24 V dc
ON-state saturation voltage: < 0.25 V at 10 mA dc; < 0.5 V at 50 mA dc

Output Response Time
1 millisecond ON and OFF

Repeatability
250 microseconds

Indicators
Green ON: sensor power ON
Green flashing: output overload
Amber ON: light is sensed
Amber flashing: marginal excess gain (1 to 1.5 times) in light condition

Construction
Black ABS/polycarbonate housing with clear acrylic lens

Environmental Rating
IEC IP54; NEMA 3

Connections
2 m (6.5 ft) attached cable: three #28 ga stranded conductors with PE insulation; PVC outer cable jacket; or
150 mm (6 inch) cable with 3-pin Pico-style quick-disconnect fitting.
QD cables are ordered separately.

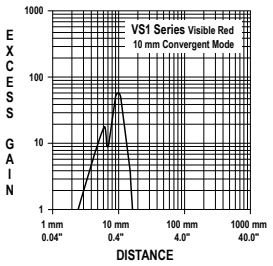
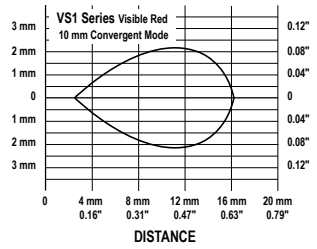
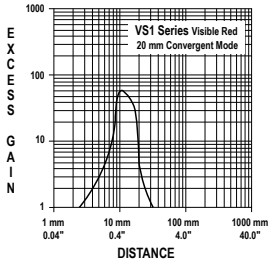
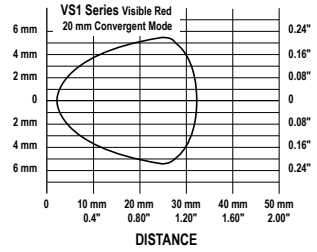
Operating Conditions
−20 °C to +55 °C (−4 °F to +131°F)
80% at +50 °C maximum relative humidity (non-condensing)

Application Notes
M2 stainless steel mounting hardware included (see Installation Notes).
Optional mounting brackets are
available (see Accessories list).

Certifications

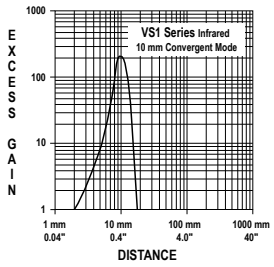
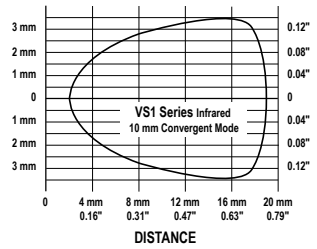
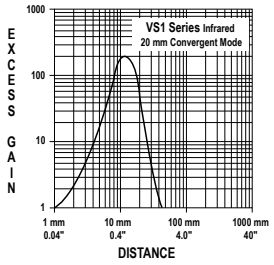
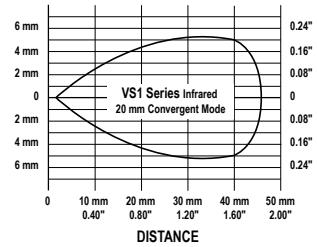
Performance Curves

Table 1: Visible Red Beam Models[2]

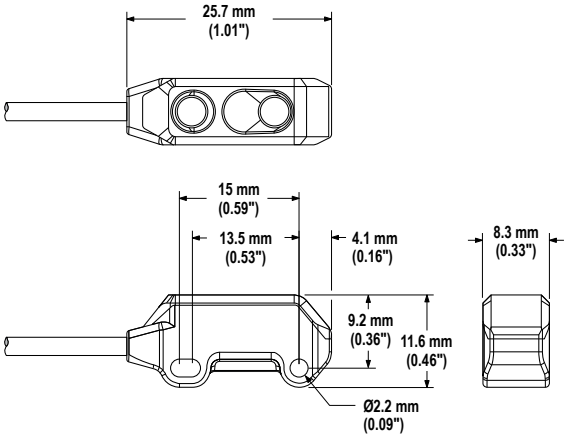
	Excess Gain	Beam Pattern
VS1...CV10		
VS1...CV20		

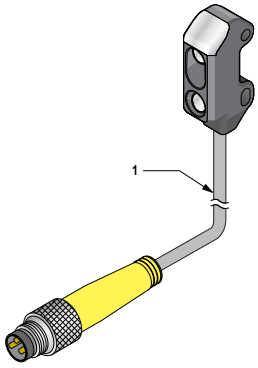
[2] *Performance based on 90% reflectance white card test*

Table 2: Infrared Beam Models[2]

	Excess Gain	Beam Pattern
VS1...C10		
VS1...C20		

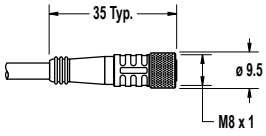
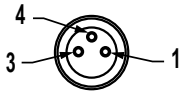
Dimensions

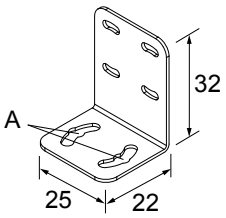
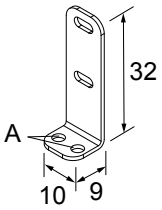
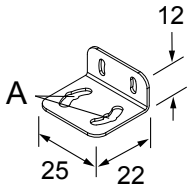
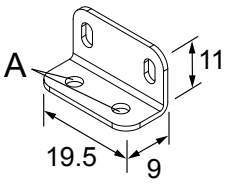




1. 150 mm (6 in) Cable

Accessories

3-Pin Threaded M8/Pico-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
PKG3M-2	2 m (6.56 ft)	Straight		 1 = Brown 3 = Blue 4 = Black
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)			

Brackets	
SMBVS1T • Tall right-angle bracket • Stainless steel Hole center spacing: A = 16.8 Hole size: A = 3.5 x 12.3 	SMBVS1TC • Tall right-angle compact bracket • 300 stainless steel Hole center spacing: A = 5.5 Hole size: A = ø 2.8 
SMBVS1S • Short right-angle bracket • 18-ga. stainless steel Hole center spacing: A = 16.8 Hole size: A = 3.5 x 12.3 	SMBVS1SC • Short right-angle bracket • 18-ga. stainless steel Hole center spacing: A = 10.0 Hole size: A = ø 2.8 

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