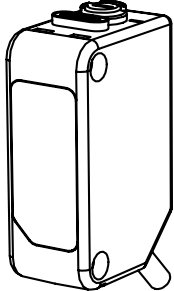


# WORLD-BEAM® Q20 Sensor with Background Suppression



## Datasheet

Compact sensors featuring adjustable range background suppression mode



- Photoelectric sensors in a compact, rugged, sealed, over-molded plastic housing
- Standard 3 mm threaded mounting holes on 25.4 mm (1 in) spacing
- Simple single-turn potentiometer adjustment of cutoff distance from 30 to 200 mm
- Enhanced immunity to fluorescent lights
- Crosstalk immunity algorithm allows two sensors to be used in close proximity
- High-intensity, bright red LED spot makes sensor alignment fast and easy
- Bright indicator LEDs show operating status from 360°
- Small bright red spot for reliable detection of colorfully printed packages and small parts or features



### WARNING:

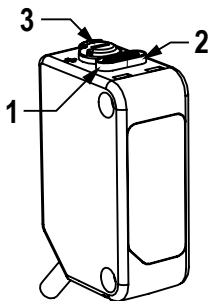
- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

## Models

Model <sup>1</sup>	Output Type	Sensing Range	Supply Voltage
Q20NAF200	Complementary NPN	Adjustable Cutoff: 30 mm to 200 mm	10 V dc to 30 V dc
Q20PAF200	Complementary PNP		
Q20KAF200Q7	IO-Link		

## Overview

The WORLD-BEAM® Q20 Sensor with Background Suppression detects targets within the cutoff distance while ignoring objects in the background. Background suppression mode is recommended when target position is repeatable, but target color and background conditions vary.



### Key

- 1 Green LED: Power Indicator
- 2 Amber LED: Light Sensed Indicator (Flashes for Marginal Conditions)
- 3 Cutoff Point Adjustment Potentiometer

<sup>1</sup> 2 m (6.5 ft) PVC cabled models are listed for the complementary output models. 2 m (6.5 ft) and 9 m (30 ft) PVC cabled options are not available on IO-Link models.

- To order the 9 m (30 ft) PVC cable model, add the suffix "W/30" to the cabled model number. For example, Q20NAF200 W/30.
- To order the 4-pin M8/Pico-style integral quick disconnect model, add the suffix "Q7" to the model number. For example, Q20NAF200Q7.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M12/Euro-style quick disconnect, add the suffix "Q5" to the model number. For example, Q20NAF200Q5.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M8/Pico-style quick disconnect, add the suffix "Q" to the model number. For example, Q20NAF200Q.
- Models with a quick disconnect require a mating cordset.



## Installation Instructions

### Sensor Orientation

Optimize detection reliability and minimum object separation performance with correct sensor-to-target orientation. To ensure reliable detection, orient the sensor as shown in relation to the target to be detected.

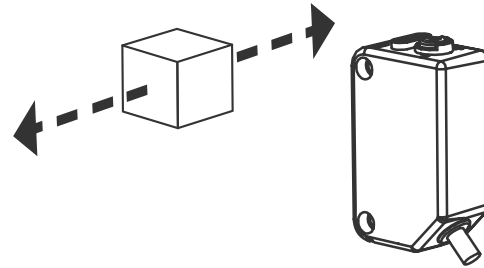
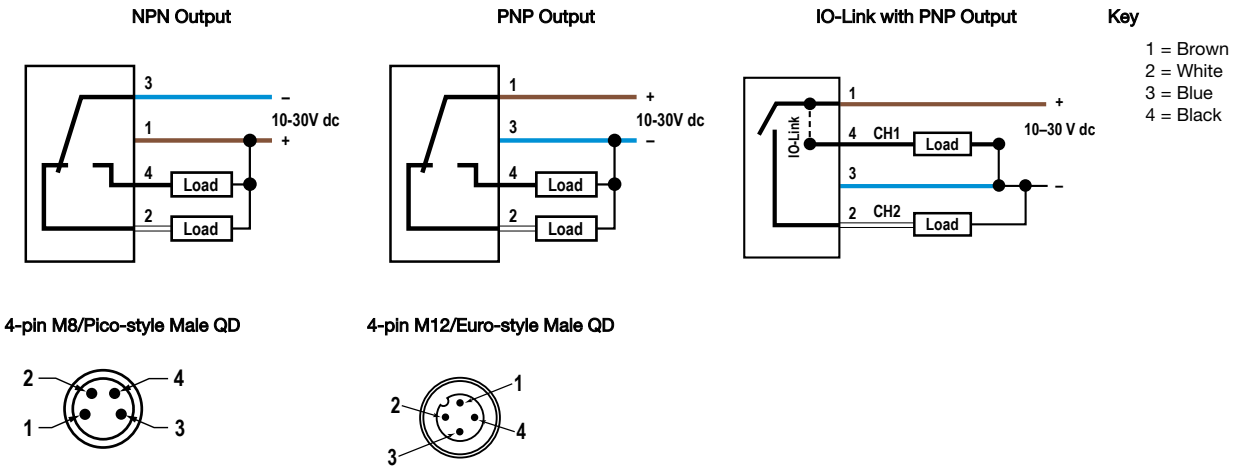


Figure 1. Optimal Orientation of Target to Sensor

### Wiring Diagrams

Cabled wiring diagrams are shown. Quick disconnect wiring diagrams are functionally identical.



### Set up the Sensor

Background Suppression Mode: Objects beyond the set cutoff distance will not be detected. Background suppression mode can be used in most situations with varying object colors and positions or with varying background conditions.

To ensure reliable background suppression, a minimum separation distance between the object and the background is necessary.

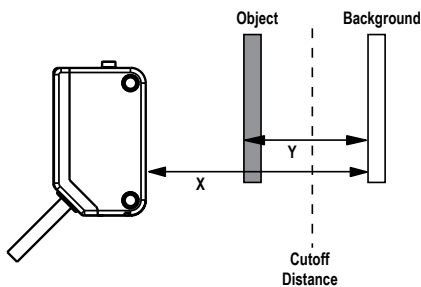


Figure 2. Minimum Separation Distance

X: Distance to the Object

Y: Minimum Separation Between the Object and the Background

Set the cutoff distance approximately midway between the farthest object and the closest background.

1. Mount the sensor with the darkest object at the longest application distance.  
The distance to the object must be less than shown in [Figure 4](#) (p. 5) for your object color.