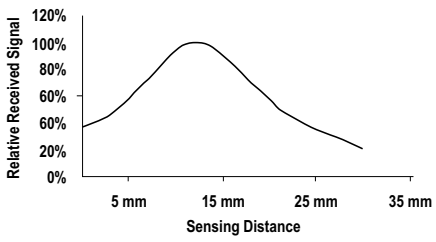
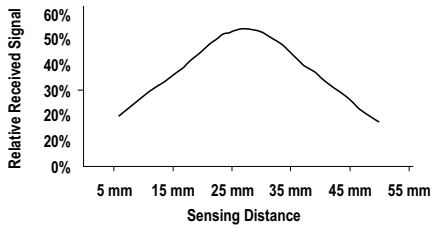
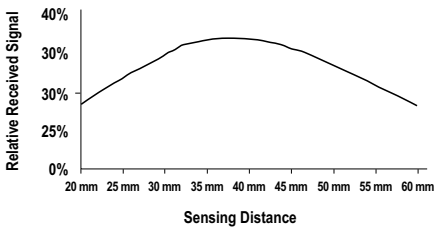
QL56 Series Luminescence Sensor

High-performance Luminescence Sensor

Features

- Senses luminescent marks, even on luminescent backgrounds and irregular or reflective surfaces
- High-power UV emission and a line of structured light provide a uniform and consistent beam for improved sensitivity
- Fast switching frequency and response time
- Push button programming for easy setup and clear bargraph indicator
- Choice of operating distance depending on model
- Durable, compact aluminum housing
- Bipolar (1 NPN & 1 PNP) output, plus 0.75 to 5.5V dc analog output
- 5-position swivel QD connector

Models

Model	Operating Distance	Cable/Connector	Supply Voltage	Outputs	Sensor Performance
QL56M6XD15BQ	10 to 20 mm (0.39" to 0.79")	5-pin Euro-style (M12) QD connector	15 to 30V dc	One NPN and PNP discrete plus one 0.75 to 5.5V dc analog	
QL56M6XD30BQ	20 to 40 mm (0.79" to 1.57")				
QL56M6XD40BQ	30 to 50 mm (1.18" to 1.97")				

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

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

142396

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Overview

The QL56 Series Luminescence Sensor is an easy-to-use, extremely sensitive luminescence sensor that emits ultraviolet (UV) light from high-power LEDs and detects visible light created by luminescent targets. This technology allows for the detection of luminescent marks (even invisible ones) on any surface, independently from its material, color, or distance inside the operating range, as long as the target radiates visible light when illuminated with UV light.

Applications

The QL56 can be used to error-proof manufacturing lines and verify the presence of glues, lubricants, tamper-proof labels, inks, paint, or the inspector's UV mark. There are many applications where the unique property of luminescence can be used to verify that a chemical or adhesive was applied, to inspect for leaks on a seal, or to ensure a critical manufacturing step was completed.

Many materials exhibit luminescence naturally or can be enhanced to include luminescence dyes (also known as luminophores). For example, white bond paper exhibits luminescence under the UV light without any additional treatment. Or a corrosion prevention treatment may be enhanced to include a luminescence dye so that its application can be verified later.

The Advantage of the QL56

The QL56 sensor uses six UV LEDs which create a uniform and intense line of UV light. The structured light allows for reliable detection of luminescence marks on irregular or textured surfaces such as wood, textile, or cast surfaces. The sensor's durable aluminum housing ensures years of use in challenging environments. Most applications can be addressed with the bi-polar discrete outputs, but an analog output signal is available to make subtle pass or fail decisions if greater contrast resolution is required.

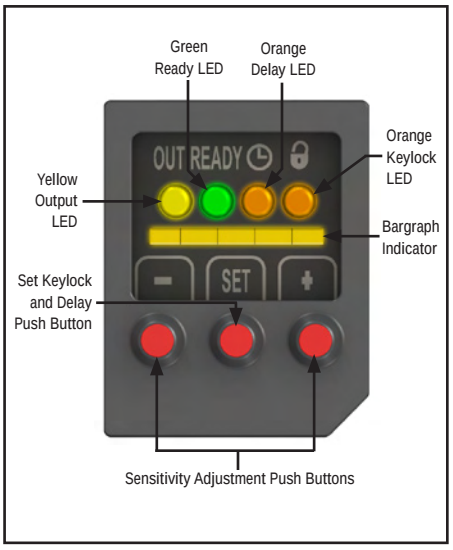


Figure 1. Features

Sensor Configuration

General Notes on Configuration

- The sensor has a KEYLOCK function that deactivates the push buttons to avoid accidental sensor setting. The push buttons are locked at sensor power-up (KEYLOCK LED OFF). To enable the push buttons, press and hold the SET push button for 5 seconds; there is a 2 minute timeout for the keylock.
- The DELAY SETTING extends the minimum active output status duration to 20 ms, allowing slower interface systems to detect shorter pulses.
- The analog output supplies a voltage proportional to the signal received by the sensor. The voltage supplied is 0.75 to 5.5V.

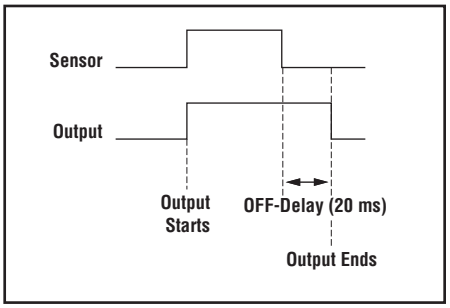
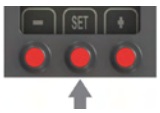


Figure 4. OFF-delay: output continues for 20 ms after sensing stops

	Procedure	Result
Keylock Setting	• Press and hold the SET push button for 5 seconds (the keyboard will automatically re-lock if inactive for 2 minutes). 	Keylock LED: ON 
Sensitivity Setting	• Click the "+" and "–" push buttons to increase or decrease the sensitivity level. Hold for fast adjustment. 	Sensitivity Setting communicated by bar graph indicator 
Delay Setting	• Press and hold the SET push button for 2 seconds to toggle off-delay. 	DELAY LED: ON indicating 20 ms off-delay is active 

Installation

The sensor can be mounted using the Ø3.5 mm housing holes or the threaded M5 holes with 6 mm max. depth. (Warning: the use of excessively long screws can damage the product) The connector can be oriented at five different positions by rotating the block. The position chosen is held by a mechanical blocking system. The rotation can be carried out after sensor installation as the connector block is completely self contained inside the housing.

Specifications

Sensing Beam	LED UV, 375 nm; class 1
Sensing Range	QL56M6XD15BQ: 10 to 20 mm (0.39" to 0.79") QL56M6XD30BQ: 20 to 40 mm (0.79" to 1.57") QL56M6XD40BQ: 30 to 50 mm (1.18" to 1.97")
Supply Voltage and Current	15 to 30 V dc (2 Vpp max. ripple); 50 mA max. @ 24V dc (excluding output current)
Supply Protection Circuitry	Protected against reverse polarity
Output Configuration	Bipolar (1 NPN & 1 PNP), plus 0.75 to 5.5V dc analog output
Analog Output	0.75 to 5.5V dc max
Analog Output impedance	2.2 kΩ (short-circuit protection)
Output Rating	100 mA max.
Output saturation voltage	≤ 2V
Output Protection Circuitry	Overload and short circuit protection
Output Response Time	250 µs
Switching Frequency	2 kHz
Delay	0 ms (default) or 20 ms user selectable
Adjustments	"+" and "–" push buttons determine sensitivity "Set" push button activates delay and keylock function (see page 2)
Indicators	Yellow OUTPUT LED: ON indicates output conducting Green READY LED: ON indicates power on; Flashing indicates output overload Orange DELAY LED: ON indicates 20 ms delay activated Orange KEYLOCK LED: ON indicates push buttons are unlocked 5-segment bar graph: Indicates sensitivity
Construction	Aluminum housing, glass lens; mass 180 g max.
Environmental rating	IP67
Connections	5-pin Euro-style (M12) integral QD
Operating Conditions	Temperature: –10º to +55º C (14º to 131º F) Storage Temperature: –20º to +70º C (–4º to +158º F)
Minimum Spot Dimension	2 x 8 mm @ 10 mm (QL56M6XD15BQ) 3 x 11 mm @ 24 mm (QL56M6XD30BQ) 4 x 15 mm @ 50 mm (QL56M6XD40BQ)
Ambient Light Rejection	According to EN 60947-5-2
Shock resistance	30 G; 6 shocks per axis; 11 ms duration (EN60068-2-27)
Vibration	0.5 mm amplitude; 10 to 55 Hz frequency, per axis (EN60068-2-6)
Application Notes	The lens must be used in the lower position, and the cap must remain in place on the end position.
Certifications	CE

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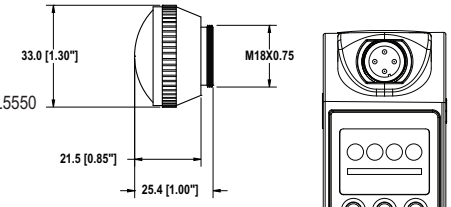
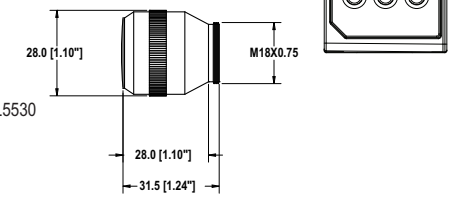
Dimensions

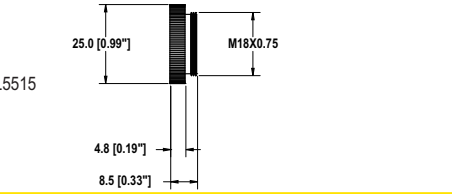
Model QL56M6XD40BQ8
Replacement Lens: UC-QL5550

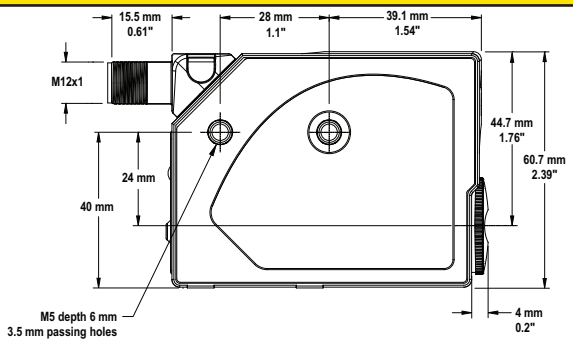


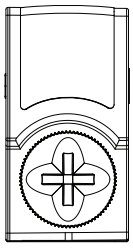
Model QL56M6XD30BQ8
Replacement Lens: UC-QL5530

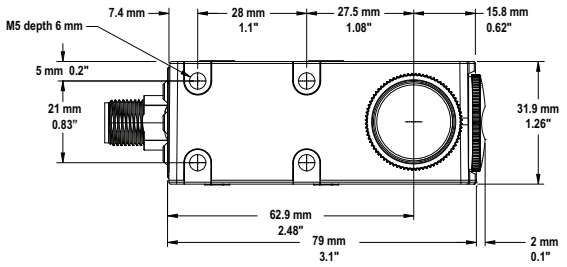


Model QL56M6XD15BQ8
Replacement Lens: UC-QL5515

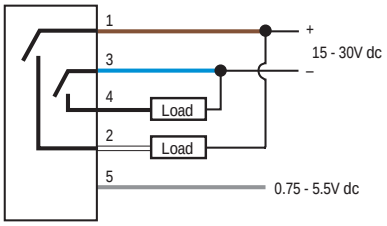








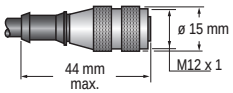
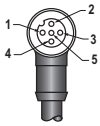
Hookups



Wiring Key:

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Gray

Quick-Disconnect Cables

Style	Model	Length	Dimensions	Pin Out
5-Pin Straight Euro-style (M12)	MQDC20-506 MQDC20-515 MQDC20-530	2 m (6.5') 5 m (15') 9 m (30')		Female  1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray

Mounting Brackets

SMB55A	SMB55RA	SMB55F	SMB55S
• 15° offset bracket • 12-gauge stainless steel	• Right-angle bracket • 12-gauge stainless steel	• Flat-mount bracket • 12-gauge stainless steel	• 15° offset bracket • 12-gauge stainless steel
			

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