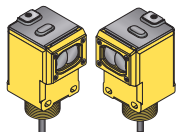


## Q45BB6 Series Features



- Advanced one-piece photoelectric sensors with outstanding optical performance and extremely rugged design
- Operate from: 10 to 30V dc
- Bipolar NPN (sinking)/PNP (sourcing) outputs on all models
- Multiple sensing modes include: opposed, diffuse, retroreflective and convergent, plus glass and plastic fiber optic models
- Switchable light/dark operate
- Highly visible Power, Signal (AID™ System\*), and Output indicator LEDs
- Versatile plug-in modules available for output timing logic and/or signal strength display
- Choice of prewired 2 m (6.5') or 9 m (30') unterminated cable, plus Mini-style or Euro-style quick-disconnect fittings
- Versatile mounting options
- Designed to withstand 1200 psi washdown; exceeds its NEMA 6P and IEC IP67 rating

\*U.S. Patent no. 4356393



Because of their extremely high excess gain, these opposed-mode sensors are an excellent option for sensing in contaminated or dirty areas, and are also the best choice for long-range sensing.



Infrared, 880 nm


## Q45BB6 Series Opposed-Mode Emitter (E) and Receiver (R) Models

Models	Range	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
Q456E Emitter	60 m (200')	2-wire 2m (6.5')	10 to 30V dc	Bipolar NPN/PNP		
Q45BB6R Receiver		4-wire 2m (6.5')				
Q456EQ Emitter		4-Pin Mini-style QD				
Q45BB6RQ Receiver						
Q456EQ5 Emitter		4-Pin Euro-style QD				
Q45BB6RQ5 Receiver						

NOTES: i) 9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., Q456E W/30)  
ii) A model with a QD connector requires a mating cable; see page 10.

**IMPORTANT: SEE SAFETY USE WARNING ON BACK PAGE**

## Q45BB6 Series Specifications

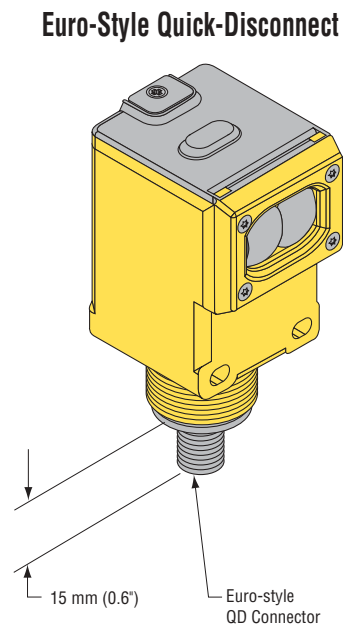
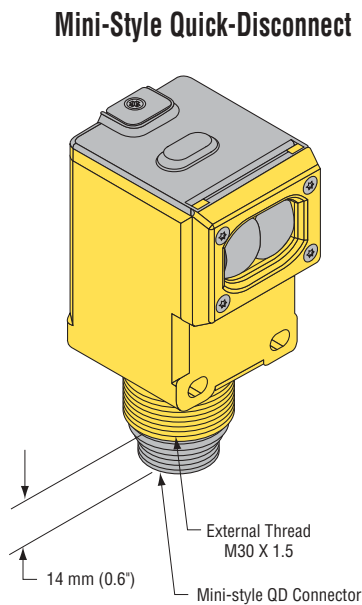
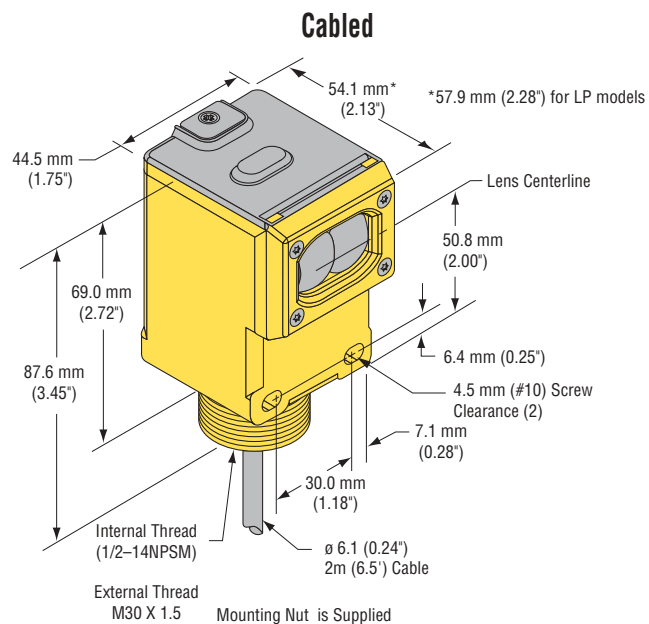
<b>Supply Voltage and Current</b>	10 to 30V dc (10% maximum ripple), at less than 50 mA (exclusive of load)
<b>Supply Protection Circuitry</b>	Protected against reverse polarity and transient voltages
<b>Output Configuration</b>	Bipolar: one current sourcing (PNP) and one current sinking (NPN) open-collector transistor
<b>Output Rating</b>	250 mA maximum each output up to 50°C, derated to 150 mA at 70°C (derates 5 mA/°C) <b>Off-state leakage</b> current less than 1 microamp <b>Output saturation voltage</b> (both outputs) less than 1 volt at 10 mA and less than 2 volts at 250 mA
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up and continuous overload or short circuit of outputs
<b>Output Response Time</b>	<b>Opposed mode:</b> 2 milliseconds ON, 1 millisecond OFF <b>All other sensing modes:</b> 2 milliseconds ON/OFF (NOTE: 100 millisecond delay on power-up. Output is non-conducting during this time.)
<b>Repeatability</b>	<b>Opposed mode:</b> 0.25 milliseconds <b>All other sensing modes:</b> 0.5 milliseconds Response time and repeatability specifications are independent of signal strength.
<b>Adjustments</b>	<b>Beneath sensor's transparent cover:</b> Light/Dark Operate select switch and multi-turn Sensitivity control (allows precise sensitivity setting – turn clockwise to increase gain). Optional logic and logic/display modules have adjustable timing functions (see page 10).
<b>Indicators</b>	Indicator LEDs are clearly visible beneath a raised transparent Lexan® dome on top of the sensor. <b>Power (green) LED</b> lights whenever 10 to 30V dc power is applied, and flashes to indicate output overload or output short circuit <b>Signal (red) AID™ System LED</b> lights whenever the sensor sees its modulated light source, and pulses at a rate proportional to the strength of the received light signal <b>Load (yellow) LED</b> lights whenever the output is energized <b>Optional 7-element LED</b> signal strength display modules
<b>Construction</b>	Molded reinforced thermoplastic polyester housing, o-ring-sealed transparent Lexan® cover, molded acrylic lenses, and stainless steel hardware. Q45s are designed to withstand 1200 psi washdown. The base of cabled models has a 1/2" NPS integral internal conduit thread.
<b>Environmental Rating</b>	NEMA 6P, IEC IP67
<b>Connections</b>	PVC-jacketed 2 m (6.5') or 9 m (30') cables; or 4-pin Mini-style ("Q" suffix models) or 4-pin Euro-style ("Q5" suffix models) quick-disconnect (QD) fittings are available. QD cables are ordered separately; see page 10.
<b>Operating Conditions</b>	<b>Temperature:</b> -40° to +70°C (-40° to +158°F) <b>Maximum relative humidity:</b> 90% at 50°C (non-condensing)
<b>Application Notes</b>	Optional output timing modules are available. See page 10 for more information.
<b>Certifications</b>	

Lexan® is a registered trademark of General Electric Co.

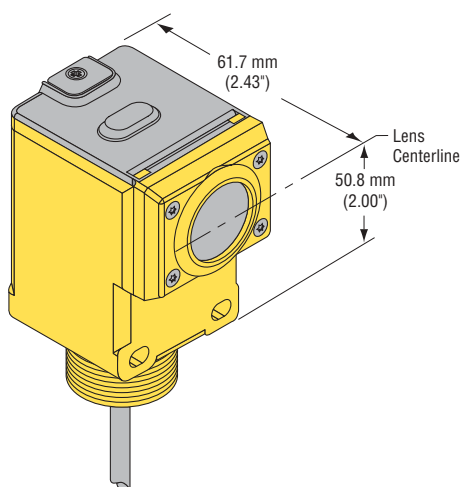
# Q45BB6 Series

## Q45BB6 Series Dimensions

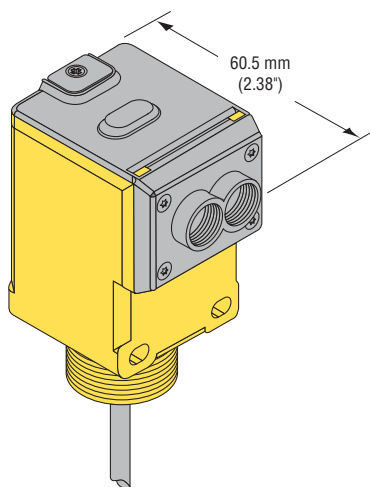
Opposed, Retro, and Diffuse Sensing Modes  
(model suffix E, R, D, DL, DX, LP & LV)



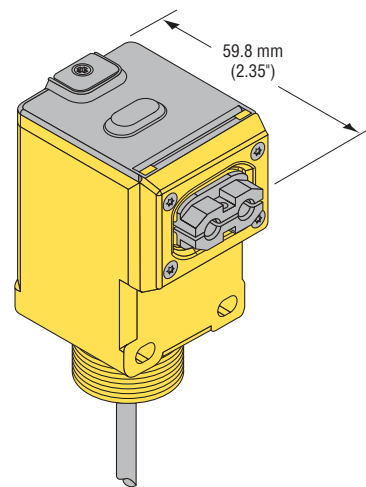
**Convergent Sensing Mode**  
(model suffix CV & CV4)



**Glass Fiber Optic**  
(model suffix F and FV)



**Plastic Fiber Optic**  
(model suffix FP)



# Q45BB6 Series Sensors

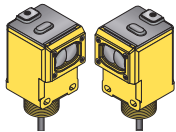
10 to 30V dc photoelectric sensors with sinking and sourcing solid-state outputs

## Q45BB6 Series Features

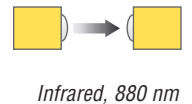


- Advanced one-piece photoelectric sensors with outstanding optical performance and extremely rugged design
- Operate from: 10 to 30V dc
- Bipolar NPN (sinking)/PNP (sourcing) outputs on all models
- Multiple sensing modes include: opposed, diffuse, retroreflective and convergent, plus glass and plastic fiber optic models
- Switchable light/dark operate
- Highly visible Power, Signal (AID™ System\*), and Output indicator LEDs
- Versatile plug-in modules available for output timing logic and/or signal strength display
- Choice of prewired 2 m (6.5') or 9 m (30') unterminated cable, plus Mini-style or Euro-style quick-disconnect fittings
- Versatile mounting options
- Designed to withstand 1200 psi washdown; exceeds its NEMA 6P and IEC IP67 rating

\*U.S. Patent no. 4356393



Because of their extremely high excess gain, these opposed-mode sensors are an excellent option for sensing in contaminated or dirty areas, and are also the best choice for long-range sensing.




## Q45BB6 Series Opposed-Mode Emitter (E) and Receiver (R) Models

Models	Range	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
Q456E Emitter	60 m (200')	2-wire 2m (6.5')	10 to 30V dc	Bipolar NPN/PNP		
Q45BB6R Receiver		4-wire 2m (6.5')				
Q456EQ Emitter		4-Pin Mini-style QD				
Q45BB6RQ Receiver						
Q456EQ5 Emitter		4-Pin Euro-style QD				
Q45BB6RQ5 Receiver						

NOTES: i) 9 m (30') cables are available by adding suffix "W/30" to the model number of any cabled sensor (e.g., Q456E W/30)  
ii) A model with a QD connector requires a mating cable; see page 10.

**IMPORTANT: SEE SAFETY USE WARNING ON BACK PAGE**

## Q45BB6 Series Specifications

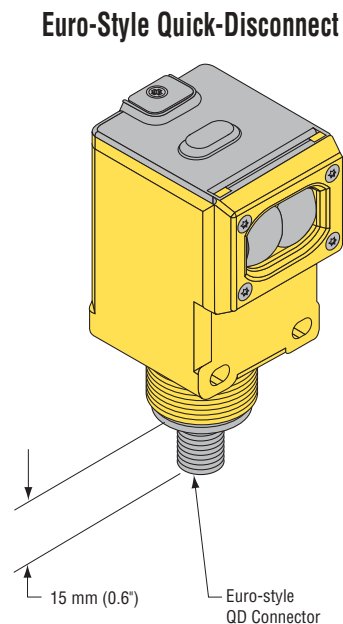
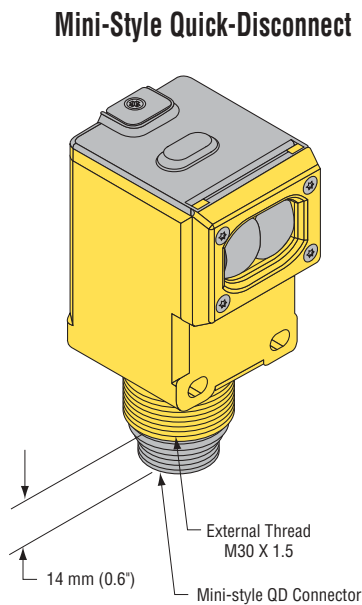
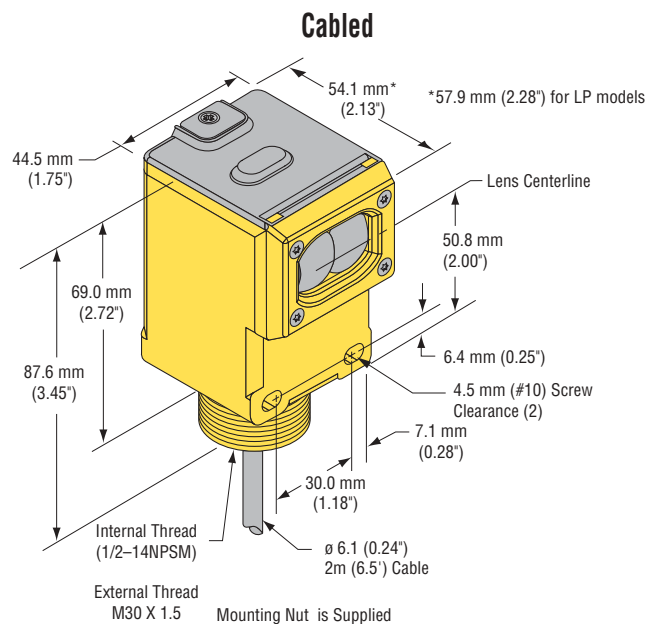
<b>Supply Voltage and Current</b>	10 to 30V dc (10% maximum ripple), at less than 50 mA (exclusive of load)
<b>Supply Protection Circuitry</b>	Protected against reverse polarity and transient voltages
<b>Output Configuration</b>	Bipolar: one current sourcing (PNP) and one current sinking (NPN) open-collector transistor
<b>Output Rating</b>	250 mA maximum each output up to 50°C, derated to 150 mA at 70°C (derates 5 mA/°C) <b>Off-state leakage</b> current less than 1 microamp <b>Output saturation voltage</b> (both outputs) less than 1 volt at 10 mA and less than 2 volts at 250 mA
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up and continuous overload or short circuit of outputs
<b>Output Response Time</b>	<b>Opposed mode:</b> 2 milliseconds ON, 1 millisecond OFF <b>All other sensing modes:</b> 2 milliseconds ON/OFF (NOTE: 100 millisecond delay on power-up. Output is non-conducting during this time.)
<b>Repeatability</b>	<b>Opposed mode:</b> 0.25 milliseconds <b>All other sensing modes:</b> 0.5 milliseconds Response time and repeatability specifications are independent of signal strength.
<b>Adjustments</b>	<b>Beneath sensor's transparent cover:</b> Light/Dark Operate select switch and multi-turn Sensitivity control (allows precise sensitivity setting – turn clockwise to increase gain). Optional logic and logic/display modules have adjustable timing functions (see page 10).
<b>Indicators</b>	Indicator LEDs are clearly visible beneath a raised transparent Lexan® dome on top of the sensor. <b>Power (green) LED</b> lights whenever 10 to 30V dc power is applied, and flashes to indicate output overload or output short circuit <b>Signal (red) AID™ System LED</b> lights whenever the sensor sees its modulated light source, and pulses at a rate proportional to the strength of the received light signal <b>Load (yellow) LED</b> lights whenever the output is energized <b>Optional 7-element LED</b> signal strength display modules
<b>Construction</b>	Molded reinforced thermoplastic polyester housing, o-ring-sealed transparent Lexan® cover, molded acrylic lenses, and stainless steel hardware. Q45s are designed to withstand 1200 psi washdown. The base of cabled models has a 1/2" NPS integral internal conduit thread.
<b>Environmental Rating</b>	NEMA 6P, IEC IP67
<b>Connections</b>	PVC-jacketed 2 m (6.5') or 9 m (30') cables; or 4-pin Mini-style ("Q" suffix models) or 4-pin Euro-style ("Q5" suffix models) quick-disconnect (QD) fittings are available. QD cables are ordered separately; see page 10.
<b>Operating Conditions</b>	<b>Temperature:</b> -40° to +70°C (-40° to +158°F) <b>Maximum relative humidity:</b> 90% at 50°C (non-condensing)
<b>Application Notes</b>	Optional output timing modules are available. See page 10 for more information.
<b>Certifications</b>	

Lexan® is a registered trademark of General Electric Co.

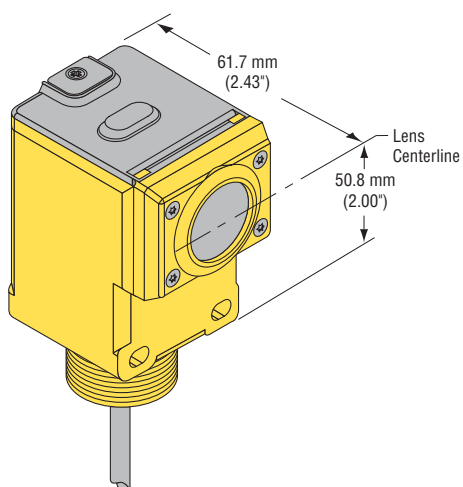
# Q45BB6 Series

## Q45BB6 Series Dimensions

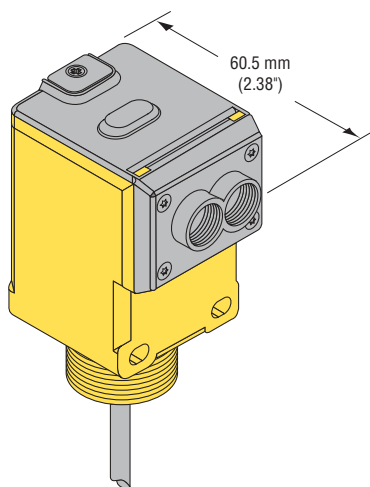
Opposed, Retro, and Diffuse Sensing Modes  
(model suffix E, R, D, DL, DX, LP & LV)



**Convergent Sensing Mode  
(model suffix CV & CV4)**



**Glass Fiber Optic  
(model suffix F and FV)**



**Plastic Fiber Optic  
(model suffix FP)**

