

Q45BB6 Series Sensors

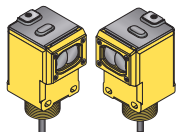
10 to 30V dc photoelectric sensors with sinking and sourcing solid-state outputs

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.



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		4-Pin Euro-style QD				
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

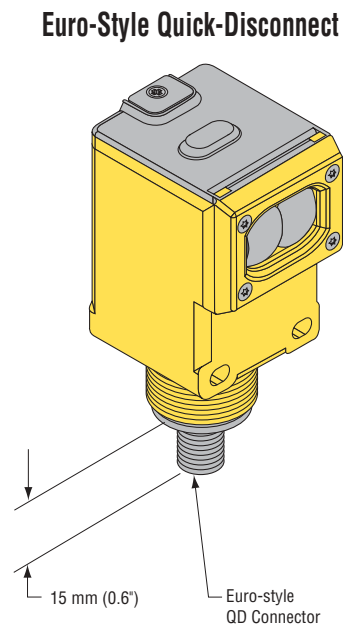
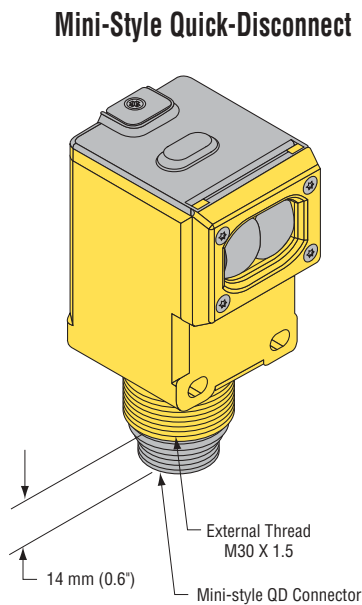
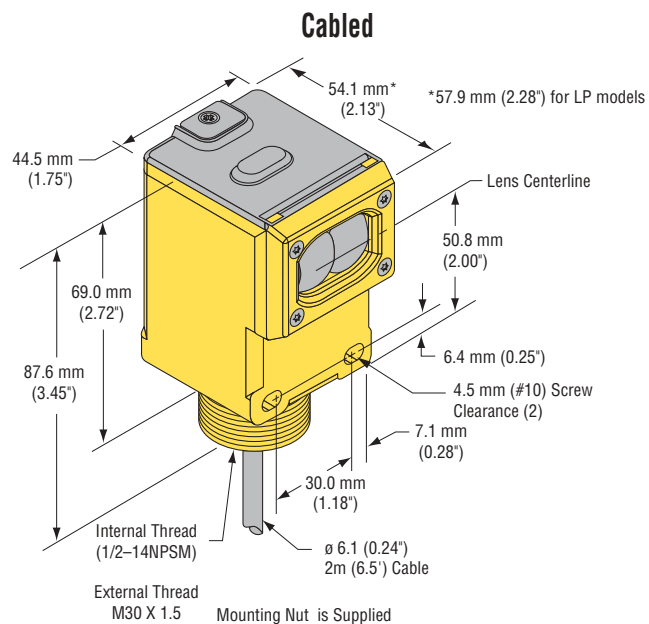
Supply Voltage and Current	10 to 30V dc (10% maximum ripple), at less than 50 mA (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Bipolar: one current sourcing (PNP) and one current sinking (NPN) open-collector transistor
Output Rating	250 mA maximum each output up to 50°C, derated to 150 mA at 70°C (derates 5 mA/°C) Off-state leakage current less than 1 microamp Output saturation voltage (both outputs) less than 1 volt at 10 mA and less than 2 volts at 250 mA
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response Time	Opposed mode: 2 milliseconds ON, 1 millisecond OFF All other sensing modes: 2 milliseconds ON/OFF (NOTE: 100 millisecond delay on power-up. Output is non-conducting during this time.)
Repeatability	Opposed mode: 0.25 milliseconds All other sensing modes: 0.5 milliseconds Response time and repeatability specifications are independent of signal strength.
Adjustments	Beneath sensor's transparent cover: 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).
Indicators	Indicator LEDs are clearly visible beneath a raised transparent Lexan® dome on top of the sensor. Power (green) LED lights whenever 10 to 30V dc power is applied, and flashes to indicate output overload or output short circuit Signal (red) AID™ System LED lights whenever the sensor sees its modulated light source, and pulses at a rate proportional to the strength of the received light signal Load (yellow) LED lights whenever the output is energized Optional 7-element LED signal strength display modules
Construction	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.
Environmental Rating	NEMA 6P, IEC IP67
Connections	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.
Operating Conditions	Temperature: -40° to +70°C (-40° to +158°F) Maximum relative humidity: 90% at 50°C (non-condensing)
Application Notes	Optional output timing modules are available. See page 10 for more information.
Certifications	

Lexan® is a registered trademark of General Electric Co.

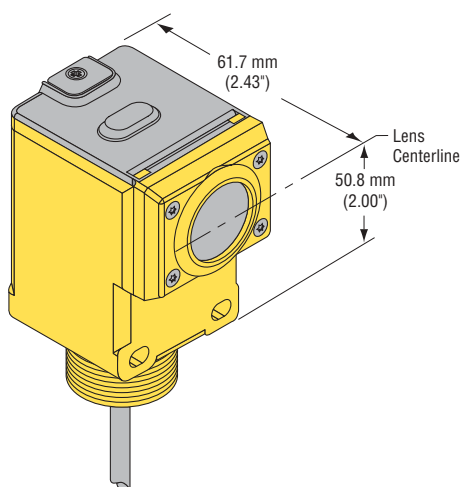
Q45BB6 Series

Q45BB6 Series Dimensions

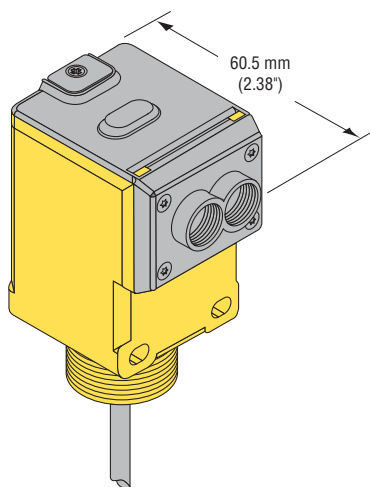
Opposed, Retro, and Diffuse Sensing Modes
(model suffix E, R, D, DL, DX, LP & LV)



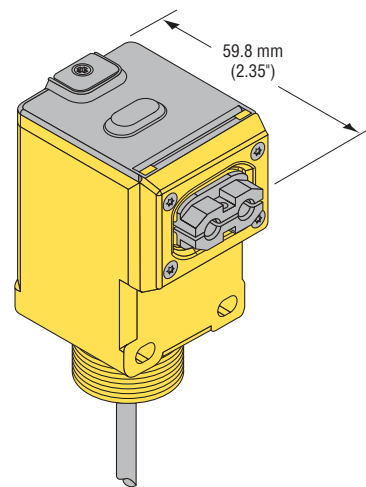
**Convergent Sensing Mode
(model suffix CV & CV4)**



**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

Status indicators and adjustments beneath transparent, o-ring sealed cover (see page 9)



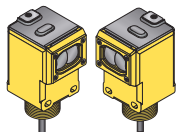
Rugged housing rated IEC IP67; withstands 1200 psi washdown

Choose integral cable or quick-disconnect



- 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

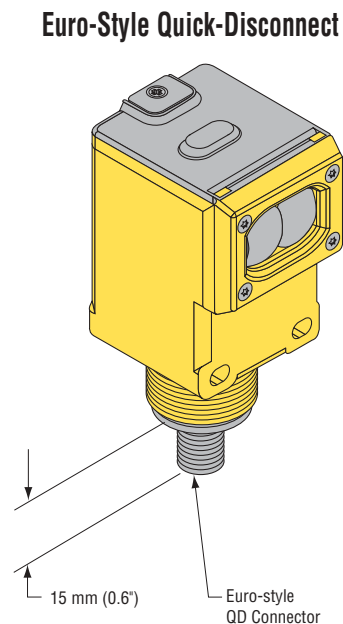
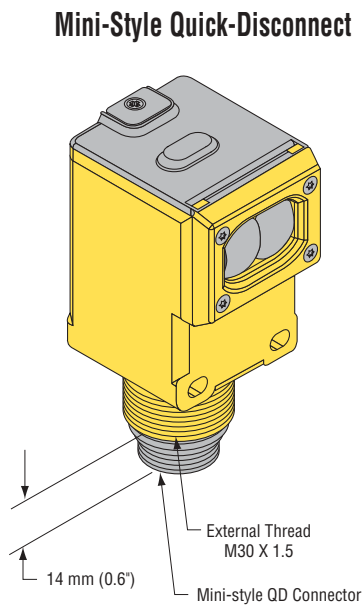
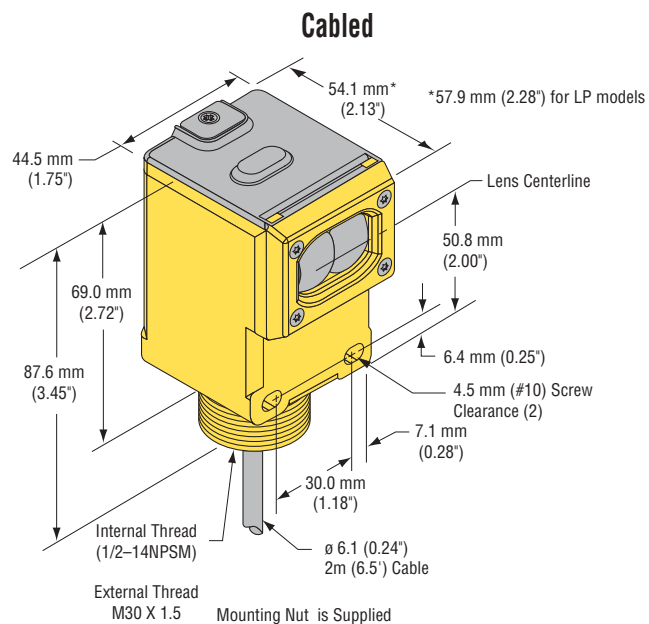
Supply Voltage and Current	10 to 30V dc (10% maximum ripple), at less than 50 mA (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Bipolar: one current sourcing (PNP) and one current sinking (NPN) open-collector transistor
Output Rating	250 mA maximum each output up to 50°C, derated to 150 mA at 70°C (derates 5 mA/°C) Off-state leakage current less than 1 microamp Output saturation voltage (both outputs) less than 1 volt at 10 mA and less than 2 volts at 250 mA
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response Time	Opposed mode: 2 milliseconds ON, 1 millisecond OFF All other sensing modes: 2 milliseconds ON/OFF (NOTE: 100 millisecond delay on power-up. Output is non-conducting during this time.)
Repeatability	Opposed mode: 0.25 milliseconds All other sensing modes: 0.5 milliseconds Response time and repeatability specifications are independent of signal strength.
Adjustments	Beneath sensor's transparent cover: 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).
Indicators	Indicator LEDs are clearly visible beneath a raised transparent Lexan® dome on top of the sensor. Power (green) LED lights whenever 10 to 30V dc power is applied, and flashes to indicate output overload or output short circuit Signal (red) AID™ System LED lights whenever the sensor sees its modulated light source, and pulses at a rate proportional to the strength of the received light signal Load (yellow) LED lights whenever the output is energized Optional 7-element LED signal strength display modules
Construction	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.
Environmental Rating	NEMA 6P, IEC IP67
Connections	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.
Operating Conditions	Temperature: -40° to +70°C (-40° to +158°F) Maximum relative humidity: 90% at 50°C (non-condensing)
Application Notes	Optional output timing modules are available. See page 10 for more information.
Certifications	

Lexan® is a registered trademark of General Electric Co.

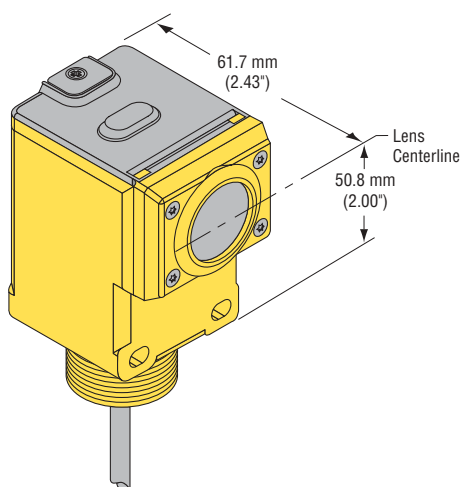
Q45BB6 Series

Q45BB6 Series Dimensions

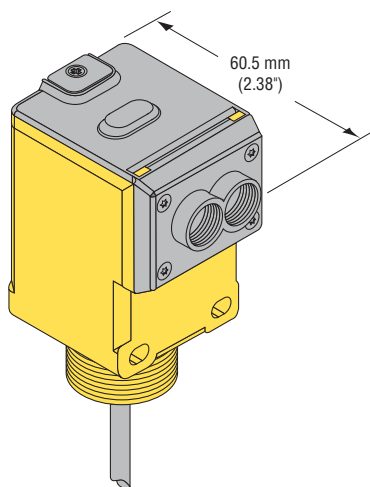
Opposed, Retro, and Diffuse Sensing Modes
(model suffix E, R, D, DL, DX, LP & LV)



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



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



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

