

Q60 Series

Long-Range, Adjustable-Field Sensors



- Detects objects with a defined sensing field, ignoring objects located beyond the sensing point
- Output timing ON/OFF
- Available in 10-30 V dc, 12-250 V dc or 24-250 V ac
- Features two-turn, logarithmic adjustment of sensing field cutoff point from 0.2 to 2 m
- Easy push-button or remote programming of output timing
- Cordsets and brackets see page 90

Adjustable-Field Q60, 10-30 V DC

Infrared LED

Visible Red LED

Sensing Mode	Range	Connection	Output Type	Models
 ADJUSTABLE-FIELD	Min.: 65 - 130 mm [†] Cutoff: 200 - 1000 mm	2 m	Bipolar NPN/PNP	Q60BB6AFV1000
		5-Pin Euro QD		Q60BB6AFV1000Q
 ADJUSTABLE-FIELD	Min.: 50 - 125 mm [†] Cutoff: 200 - 2000 mm	2 m	Bipolar NPN/PNP	Q60BB6AF2000
		5-Pin Euro QD		Q60BB6AF2000Q

Laser Adjustable-Field Q60, 10-30 V DC

Visible Red Laser

Sensing Mode	Range	Connection	Output Type	Models
 CLASS 1 LASER LASER ADJUSTABLE-FIELD	Min.: 100 - 260 mm [†] Cutoff: 200 - 1400 mm	2 m	Bipolar NPN/PNP	Q60BB6LAF1400
		5-Pin Euro QD		Q60BB6LAF1400Q
 CLASS 2 LASER LASER ADJUSTABLE-FIELD	Min.: 75 - 240 mm [†] Cutoff: 200 - 2000 mm	2 m	Bipolar NPN/PNP	Q60BB6LAF2000
		5-Pin Euro QD		Q60BB6LAF2000Q

For more specifications see page 91.

Connection options: A model with a QD requires a mating cordset (see page 90).

For 9 m cable, add suffix W/30 to the 2 m model number (example, Q60BB6AF2000 W/30).

[†] Minimum range varies by established cutoff point (see excess gain curves, page 142 and cutoff point deviation curves, page 143).

Adjustable-Field Q60, 12-250 V DC or 24-250 V AC



Sensing Mode	Range	Connection	Output Type	Models
 ADJUSTABLE-FIELD	Min.: 65 - 130 mm [†] Cutoff: 200 - 1000 mm	2 m	SPDT e/m Relay	Q60VR3AFV1000
		4-Pin Micro QD	SPDT e/m Relay	Q60VR3AFV1000Q1
 ADJUSTABLE-FIELD	Min.: 50 - 125 mm [†] Cutoff: 200 - 2000 mm	2 m	SPDT e/m Relay	Q60VR3AF2000
		4-Pin Micro QD	SPDT e/m Relay	Q60VR3AF2000Q1

Laser Adjustable-Field Q60, 12-250 V DC or 24-250 V AC



Sensing Mode	Range	Connection	Output Type	Models
 ADJUSTABLE-FIELD	Min.: 100 - 260 mm [†] Cutoff: 200 - 1400 mm	2 m	SPDT e/m Relay	Q60VR3LAF1400
		4-Pin Micro QD	SPDT e/m Relay	Q60VR3LAF1400Q1
 ADJUSTABLE-FIELD	Min.: 75 - 240 mm [†] Cutoff: 200 - 2000 mm	2 m	SPDT e/m Relay	Q60VR3LAF2000
		4-Pin Micro QD	SPDT e/m Relay	Q60VR3LAF2000Q1

For more specifications see page 91.

Connection options: A model with a QD requires a mating cordset (see page 90).
 For 9 m cable, add suffix W/30 to the 2 m model number (example, Q60VR3AFV1000 W/30).
[†] Minimum range varies by established cutoff point (see excess gain curves, page 142 and cutoff point deviation curves, page 143).



5-Pin
MQDC1-506
 2 m (6.5')
MQDC1-515
 5 m (15')
MQDC1-530
 9 m (30')

Euro-Style
 Straight connector models listed;
 for right-angle, add **RA** to the end
 of the model number (example,
MQDC1-506RA)



4-Pin
MQAC-406
 2 m (6.5')
MQAC-415
 5 m (15')
MQAC-430
 9 m (30')

Micro-Style
 Straight connector models listed;
 for right-angle, add **RA** to the end
 of the model number (example,
MQAC-406RA)

Additional cordset information is available
 See page page 758



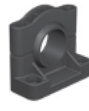
Adjustable-Field Models
 Suffix AF, AFV and LAF



SMBAMSQ60IP



SMBAMSQ60P



SMBQ60

Additional bracket information is available
 See page page 722

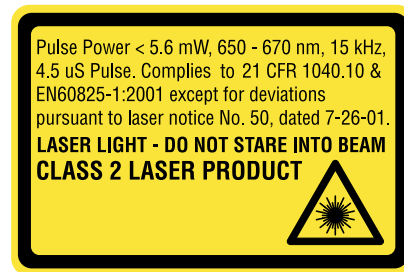


Class 1 Lasers

Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing. Reference 60825-1 Amend. 2 © IEC:2001(E), section 8.2.

For safe laser use:

- Do not permit a person to stare at the laser from within the beam
- Do not point the laser at a person's eye at close range
- Locate open laser beam paths either above or below eye level, where practical



Class 2 Lasers

Lasers that emit visible radiation in the wavelength range from 400 nm to 700 nm where eye protection is normally afforded by aversion responses, including the blink reflex. This reaction may be expected to provide adequate protection under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing. Reference 60825-1 Amend. 2 © IEC:2001(E), section 8.2.

For safe laser use:

- Do not permit a person to stare at the laser from within the beam
- Do not point the laser at a person's eye at close range
- Locate open laser beam paths either above or below eye level, where practical

Q60 Specifications

Supply Voltage and Current	Q60BB6AF and Q60BB6AFV models: 10 to 30 V dc (10% max. ripple) at less than 50 mA exclusive of load Q60BB6LAF models: 10 to 30 V dc (10% max. ripple) at less than 35 mA exclusive of load Q60VR3LAF and Q60VR3AFV Universal models: 12 to 250 V dc or 24 to 250 V ac, 50/60 Hz Input power 1.5 W max.	
Supply Protection Circuitry	Protected against reverse polarity and transient voltages (Q60VR3 model's dc hookup is without regard to polarity)	
Output Configuration	Q60BB6AF, Q60BB6AFV and Q60BB6LAF models: Bipolar: one NPN (current sinking) and one PNP (current sourcing) open-collector transistor Q60VR3AF, Q60VR3LAF and Q60VR3AFV cabled models: E/M Relay (SPDT), normally closed and normally open contacts Q60VR3AFQ1, Q60VR3AFVQ1 and Q60VR3LAFQ1 (QD) models: E/M Relay (SPST), normally open contact	
Output Rating	DC models: 150 mA max. each output @ 25 °C OFF-state leakage current: less than 5 µA @ 30 V dc Output saturation NPN: less than 200 mV @ 10 mA; less than 1 V @ 150 mA Output saturation PNP: less than 1 V at 10 mA; less than 1.5 V at 150 mA Universal Voltage models: Min. voltage and current: 5 V dc, 10 mA Mechanical life of relay: 50,000,000 operations Electrical life of relay at full resistive load: 100,000 operations Max. switching power (resistive load): Cabled models: 1250 VA, 150 W QD models: 750 VA, 90 W Max. switching voltage (resistive load): Cabled models: 250 V ac, 125 V dc QD models: 250 V ac, 125 V dc Max. switching current (resistive load): Cabled models: 5 A @ 250 V ac, 5 A @ 30 V dc derated to 200 mA @ 125 V dc QD models: 3 A @ 250 V ac, 3 A @ 30 V dc derated to 200 mA @ 125 V dc	
Output Protection Circuitry	Q60BB6AF, Q60BB6LAF and Q60BB6AFV models: Protected against continuous overload or short circuit of outputs All models: Protected against false pulse on power-up	
Output Response Time	Q60BB6AF, Q60BB6LAF and Q60BB6AFV models: 2 milliseconds ON/OFF Q60VR3AF, Q60VR3LAF and Q60VR3AFV Universal models: 15 milliseconds ON/OFF	
Delay at Power-up	150 milliseconds (Q60BB6LAF has 1 second max.); outputs do not conduct during this time	
Repeatability	500 microseconds	
Sensing Hysteresis	2000 mm cutoff - less than 3% of set cutoff distance 1600 mm cutoff - less than 2.25% of set cutoff distance 1200 mm cutoff - less than 1.30% of set cutoff distance	800 mm cutoff - less than 0.5% of set cutoff distance 400 mm cutoff - less than 0.25% of set cutoff distance
Adjustments	2 momentary push buttons: ON-delay and OFF-delay ON Delay select: 8 milliseconds to 16 seconds LO/DO select OFF Delay select: 8 milliseconds to 16 seconds Push-button lockout: for security Slotted, geared, 2-turn, cutoff range adjustment screw (mechanical stops on both ends of travel)	
Indicators	Q60AF, Q60AFV and Q60LAF models: ON-Delay Green ON Steady: Run mode, ON-delay is active Green Flashing: ON-delay Selection mode is active OFF-Delay Green ON Steady: Run mode, OFF-delay is active Green Flashing: OFF-delay Selection mode is active 5-Segment Light Bar*: Indicates relative delay time during ON/OFF-delay Selection modes Output Amber ON Steady: Outputs are conducting Green ON Steady: During ON/OFF-delay Selection modes Dark Operate Green ON Steady: Dark Operate is selected Lockout Green ON Steady: Buttons are locked out Light Operate Green ON Steady: Light Operate is selected Signal Green ON Steady: Sensor is receiving signal Green Flashing: Marginal signal (1.0 to 2.25 excess gain)	
NOTE: Outputs are active during on/off timing selection mode.	*Output, Dark Operate, Lockout, Light Operate and Signal indicators function as 5-Segment Light Bar during ON/OFF-delay Selection modes	
Laser Characteristics	Spot Size: approximately 4 x 2 mm throughout range (collimated beam) Angle of Divergence: 5 milliradians NOTE: Contact factory for custom laser spot size.	
Construction	Housing: ABS polycarbonate blend Lens: acrylic Cover: Clear ABS	
Environmental Rating	IEC IP67; NEMA 6	
Connections	2 m or 9 m integral cable. DC models offer a 5-pin Euro-style QD fitting. AC models offer 4-pin Micro-style QD fitting. QD cordsets are ordered separately. See page 90.	
Operating Conditions	Temperature: Q60BB6LAF (DC) models: -10° to +50° C Q60VR3LAF Universal models: -10° to +45° C All others: -20° to +55° C Relative humidity: 90% at 50° C (non-condensing)	
Certifications	