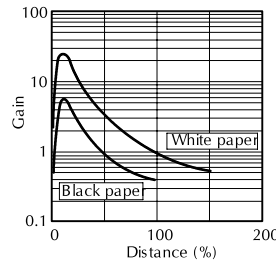


QX Series Photoelectric Sensors

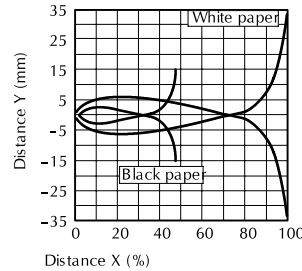


Characteristic Curves

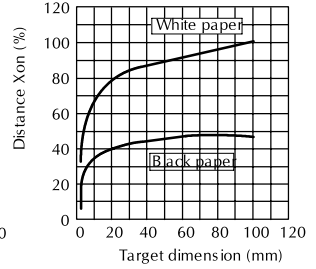
Diffuse Reflection Models (QX3)



Excess gain



Parallel displacement

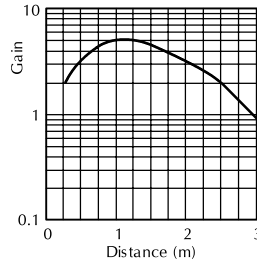


Distance/target size

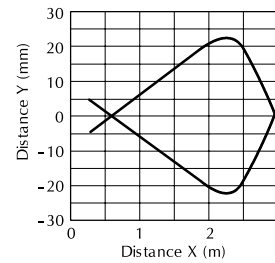
Compact High-Performance Photoelectric Sensors

- 16 models available, including diffuse, polarized retro-reflective, through-beam detection
- Axial cable and right angle optics
- Fast response time
- IP65 protection degree
- NPN/PNP selectable output
- 2 LED indicators (threshold and signal margin)

Polarized Retro-Reflective Models (QXP)



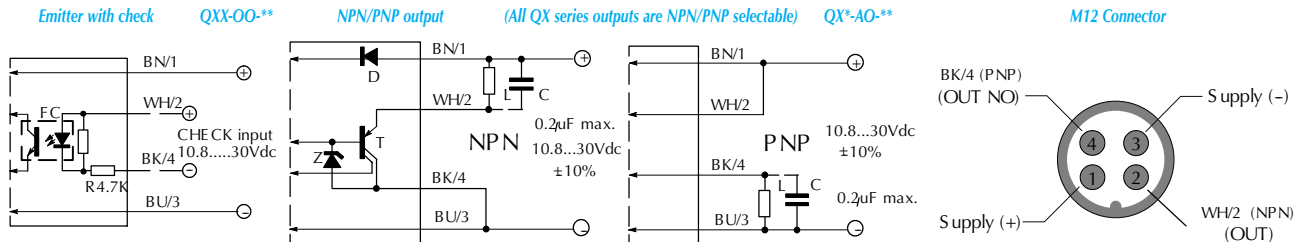
Excess gain



Parallel displacement

Note: Through-beam curves are after the specification table.

Wiring Diagrams



Check input test circuit (QXX models only): To test that the sensor is operating correctly, apply 10.8-30VDC across the WH/2 (+) and BK/4 (-) leads, which are decoupled from the power supply. In light state, light pulses are interrupted, which simulates the presence of a target and causes the output to switch. If switching does not occur, check for a fault in the system.

QX Series Part Numbers

The QX series uses a part numbering system similar to our other sensor products. For example: Part number QX3-0A-1A would be a 300mm diffuse reflection NO compact photoelectric switch, with axial optics and a 2m axial cable.

Cables and Accessories

- CD12L-0B-020-A0** Cable for quick-disconnect sensors: 12mm, straight, axial plug, 2 meter length
- CD12M-0B-070-A1** Cable for quick-disconnect sensors: 12mm, straight, axial plug, 7 meter length
- CD12L-0B-020-C0** Cable for quick-disconnect sensors: 12mm, right-angle, axial plug, 2 meter length
- CD12M-0B-070-C1** Cable for quick-disconnect sensors: 12mm, right-angle, axial plug, 7 meter length
- ST18A** Mounting bracket for 18mm sensors, straight, metal, 10 pk
- ST18C** Mounting bracket for 18mm sensors, right angle, metal, 10 pk

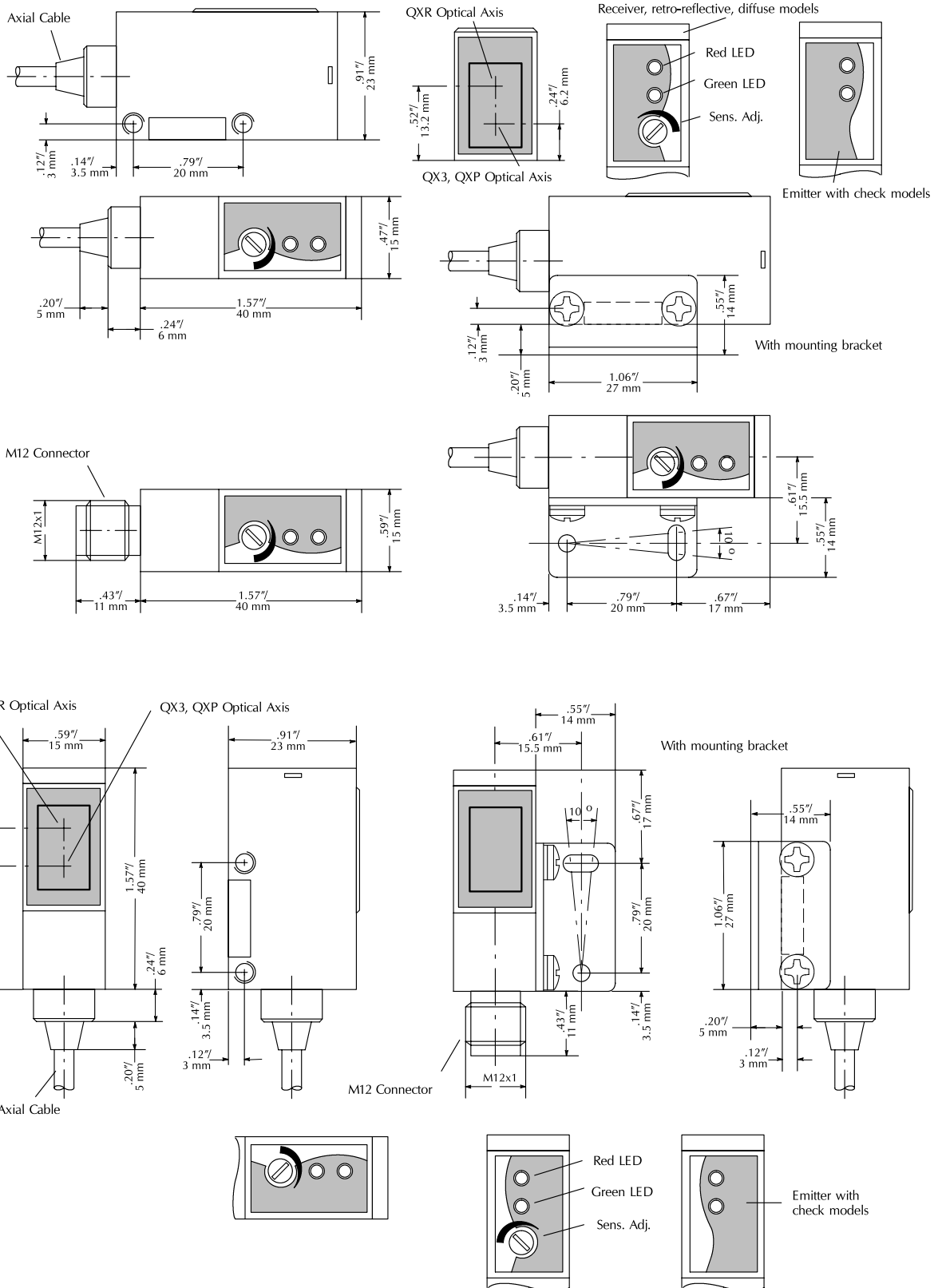
- ST02:** Adjustable, plastic mounting bracket
- Reflectors For Retro-Reflective Models (QXP):**
- RL102:** 26mm diameter round reflector (10pk)
- RL103:** 36mm diameter round reflector (10pk)
- RL104:** 47mm diameter round reflector (10pk)
- RL105:** 90mm x 40mm rectangular reflector (10pk)
- RL105G:** 182mm x 42mm rectangular reflector (10pk)
- RL109:** 83mm diameter round reflector, stud mount (10pk)
- RL110:** 84mm diameter round reflector, center hole mount (10pk)

Series		QX3-	00-	1A
Compact photoelectric switch	QX			
Model				
300mm diffuse reflection	3			
emitter with check	X			
2.5mm polarized retro-reflect.	P			
8mm standard receiver	R			
Output State				
NO (normally open) emitter	A0 (A-zero)			
	00 (zero-zero)			
Housing				
With axial optics	1			
With right angle optics	2			
Type of Cable				
With 2m (6.5ft) axial cable	A			
With M12 quick-connect ¹	E			

¹Order quick-disconnect cable separately.

Note: Use this chart to help you understand the part numbering system. Not all combinations of letters and numbers form valid part numbers. See specifications table or price list for part numbers that we offer.

Dimensions



QX Series Photoelectric Sensors

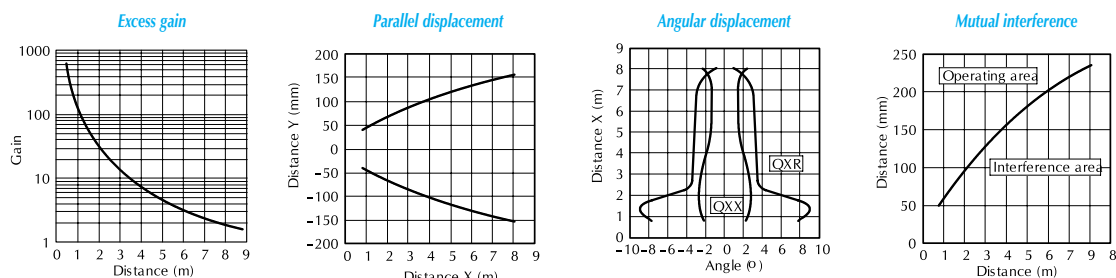


Sensors

Specifications			
Model	QX3-A0-1A QX3-A0-2A QX3-A0-1E QX3-A0-2E	QXP-A0-1A QXP-A0-2A QXP-A0-1E QXP-A0-2E	QXX-00-1A QXX-00-2A QXX-00-1E QXX-00-2E QXR-A0-1A QXR-A0-2A QXR-A0-1E QXR-A0-2E
Type	diffuse reflection ¹	polarized retro-reflective ²	through-beam ³
(Sn) Nominal Sensing Distance	300mm ⁴	2.5mm ⁵	8m
Emission	infrared (880nm)	red (660nm)	
Minimum Detectable Object	See Characteristic Curves		2mm
Sensitivity	Adjustable one-turn pot.		
Tolerance	+15/-5% Sn		
Differential Travel	10%		
Repeat Accuracy	5%		
Operating Voltage	10.8-30VDC		
Ripple	10% max.		
No-load Supply Current	20mA		20mA (em), 5mA (rec)
Check Voltage	-		10.8-30VDC (QXX)
Load Current	300mA		
Leakage Current	10µA max at 30VDC		
Voltage Drop	1.2volt maximum at 100mA		
Output Type	NPN/PNP selectable/NO (normally open) only		
Switching Frequency	750Hz (Tr=0.5ms)		500Hz (Tr=0.75ms)
(tv) Time Delay Before Availability	200 ms		
Protection From Input Voltage Transients	Yes, as long as the transient peak does not exceed 30VDC		
Protection From Input Power Polarity Reversal	Yes		
Output Power Short-Circuit Protection	Yes, (switch autoresets after overload is removed)		
Temperature Range	-25° to +70° C (-13° to 158° F)		
Interference to External Light	3,000 lux (incandescent lamp) 10,000 lux (sunlight)		
Protection Degree (DIN 40 050)	IEC IP65		
LED indicators	See Dimensional Drawings		
Housing Material	ABS (glass reinforced)		
Lens Material	Acrylic		
Weight	70g (2.47oz)		

¹Mounting bracket included ²Mounting bracket and Ø84mm round reflector included (RL110). Purchase additional reflectors separately ³An emitter (QXX) and receiver (QXR) pair is needed for a complete sensor set. ⁴With 100X100mm white matte paper ⁵With standard Ø84mm reflector (RL110)

Characteristic Curves: Through-beam Models (QXX)



Diffuse-reflection proximity switch

With this type of device, the emitter and receiver form part of the same unit. The optical beams are either parallel or slightly converging. The presence of an object in the optical field causes diffused reflection of the luminous beam. The receiver detects the reflection from the object itself. The reflective properties of the object are important. It is generally possible to reliably detect the presence of any object unless it is perfectly reflective or black. Clear objects with a reflective power of 90% are detected close to the rated operating distance. Dark objects with 18% reflectivity are detected at about half the normal operating distance.

Retro-reflective photoelectric switch

The emitter and receiver form part of the same unit. The optical beams are parallel. The emitter's luminous beam hits a reflector and is redirected toward the receiver. Detection occurs when the path of the beam is interrupted by the presence of an opaque object. Operating distance mainly depends on the quality of the reflector used and on the optical-beam angle.

Through-beam photoelectric switch

Emitter and receiver are housed in two separate units and are installed one in front of the other. Detection occurs when the path of the beam is interrupted by the presence of an opaque object.

Polarized retro-reflective photoelectric switch

This is a variant of the retro-reflective photoswitch. A polarizing filter is placed in the emitter's optical path. A polarizing filter in the receiver is oriented at a right angle to the filter in the emitter. This results in the elimination of reflections from surfaces other than the reflector. The light from the reflector possesses a component that is strongly polarized in a perpendicular direction to the incident light. It becomes the only recognizable reflected-light source.

Switching element functions

Dark operate

Allows current to flow when the path of the light beam is blocked and will prevent flow when the path of the light beam is not blocked.

Light operate

Allows current to flow when the path of the light beam is not blocked and will prevent flow when the path of the light beam is blocked.

Make NO (normally open)

Causes load current to flow when a target is detected and not to flow when a target is not detected.

Break NC (normally closed)

causes load current to flow when a target is detected and not to flow when a target is not detected.

Make-break or complementary function:

A switching element combination which contains one make function and one break function.

In order to establish a relationship between the two different modes, you must distinguish between type D sensors (light diffusion) and types R and T (light reflection or transmission):

Type	Dark operate	Light operate
Diffuse Reflective	NC	NO
Retro-reflective	NO	NC
Through-beam	NO	NC

Type of output and load connection

Three-wire NPN

Two power supply wires and one output wire. The switching element is connected between output and negative terminal. When ON, the current is drawn from load through the output terminal. The other load terminal is connected to the positive terminal of the power supply.

Three-wire PNP

Two power supply wires and one output wire. The switching element is connected between output and positive terminal. When ON, the current is drawn from positive pole and supplied to the load through the output terminal. The other load terminal is connected to the negative terminal of the power supply.

