

Output Configuration for Receiver

100 mA with short circuit protection

OFF-state leakage current:

NPN: < 200 μ A sinking (see Application Note 2);PNP: < 10 μ A sourcing

ON-state saturation voltage

NPN: < 1.6 V at 100 mA

PNP: < 3.0 V at 100 mA

Output Configuration for all Other ModelsMaximum Current $\leq$ 100 mA

PNP Output Voltage:

High $\geq$ Vsupply – VsaturationLow $\leq$ 1 V ($\leq$ 1M Ω)

NPN Output Voltage:

High $\geq$ Vsupply – 1 V ($\leq$ 1M Ω)Low $\leq$ VsaturationVsaturation $\leq$ 3 V**Output Response Time**

Opposed mode: 1 millisecond ON/600 microseconds OFF

All other models: 850 microseconds ON/OFF

100 millisecond delay on power-up; outputs do not conduct during this time

Applications Notes

1. Opposed mode sensor spacing can be reduced by alternating emitters and receivers or by applying cross talk filters (visible red models only)
2. For receiver only: NPN off-state leakage current is <200 μ A for load resistances > 3k Ω or optically isolated loads. For load currents of 100 mA, leakage is <1% of load current.

Operating Conditions

–20 °C to +60 °C (–4 °F to +140 °F)

95% at +50 °C maximum relative humidity (non-condensing)

Environmental Rating

IEC IP67; NEMA 6

Vibration and Mechanical Shock

All models meet MIL-STD-202F, Method 201A (Vibration: 10 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude, 10G maximum acceleration) requirements. Also meets IEC 60947-5-2 (Shock: 30G 11 ms duration, half sine wave) requirements.

Certifications

(Class 2 power supply required)

Connections

2 m (6.5 ft) or 9 m (30 ft) 4-wire PVC cable, 150 mm (6 in) cable with 4-pin threaded M8/Pico-style (Q) or M12/Euro-style (Q5) connector, or 4-pin integral threaded M8/Pico-style connector (Q7), depending on the model ordered

Indicators

Two LED Indicators: Power (green) and Output (amber)

Fixed-Field models:

Green on: Power ON

Amber on: Black (LO) wire conducting

All other models:

Green on: Power ON

Amber on: Black (LO) wire conducting

Amber flashing: Marginal excess gain (1 to 1.5 $\times$)

Black (LO) wire conducting

Adjustments**Diffuse, Retroreflective, and Polarized Retroreflective models (only):**

Single-turn Sensitivity (Gain) adjustment potentiometer

Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

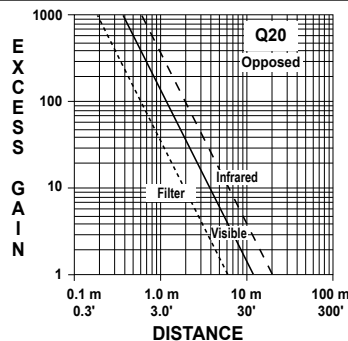
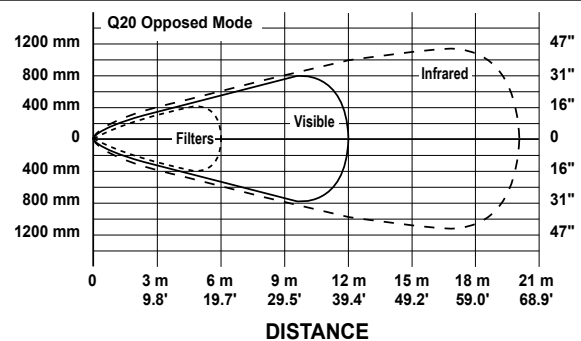
Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

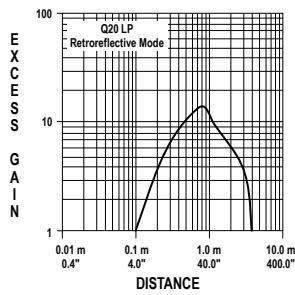
For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

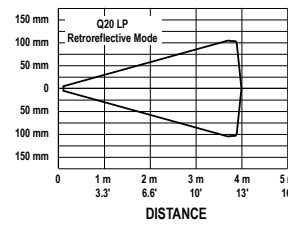
Performance Curves**Opposed Mode Models****Excess Gain****Beam Pattern**

Retroreflective Mode Models (based on retroreflector BRT-84)

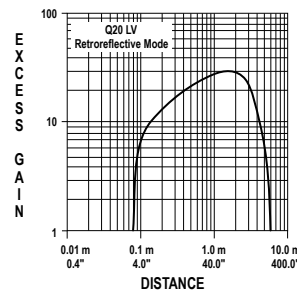
Excess Gain



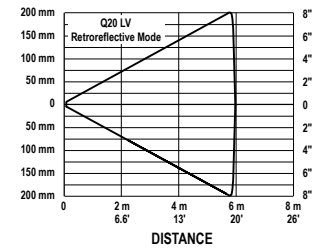
Beam Pattern



Excess Gain

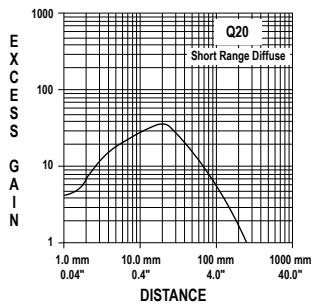


Beam Pattern

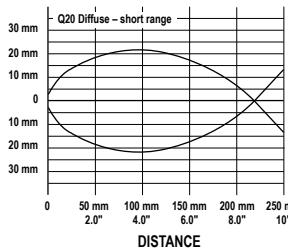


Diffuse Mode Models (based on 90% reflectance white test card)

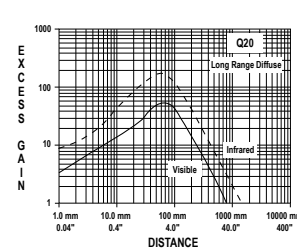
Excess Gain



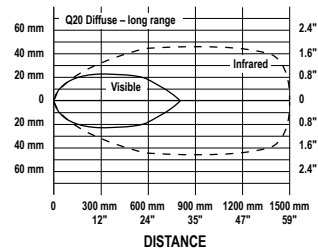
Beam Pattern



Excess Gain

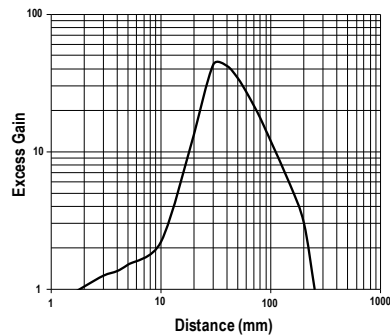


Beam Pattern

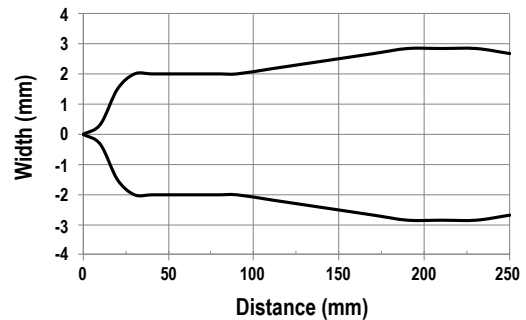


Q20DVS Models

Excess Gain



Beam Pattern



Fixed-Field Excess Gain (based on 90% reflectance white test card)

