

Output Configuration for Receiver

100 mA with short circuit protection
 OFF-state leakage current:
 NPN: < 200 µA sinking (see Application Note 2);
 PNP: < 10 µA sourcing
 ON-state saturation voltage
 NPN: < 1.6 V at 100 mA
 PNP: < 3.0 V at 100 mA

Output Configuration for all Other Models

Maximum Current ≤ 100 mA
 PNP Output Voltage:
 High ≥ Vsupply – Vsaturation
 Low ≤ 1 V (≤ 1M Ω)
 NPN Output Voltage:
 High ≥ Vsupply – 1 V (≤ 1M Ω)
 Low ≤ Vsaturation
 Vsaturation ≤ 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 µA for load resistances > 3kΩ 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 1.5x)
 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.

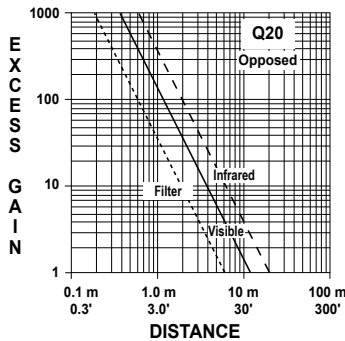
Overcurrent protection is required to be provided by end product application per the supplied table. Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply. Supply wiring leads < 24 AWG shall not be spliced. For additional product support, go to www.bannerengineering.com.

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

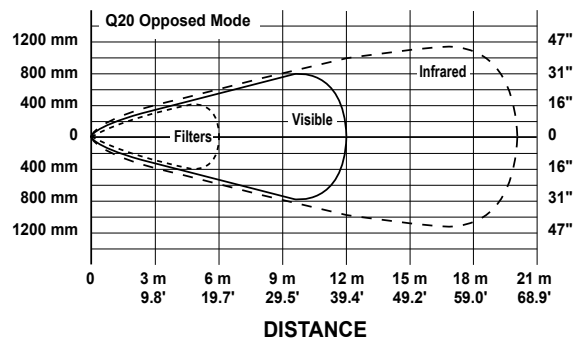
Performance Curves

Opposed Mode Models

Excess Gain

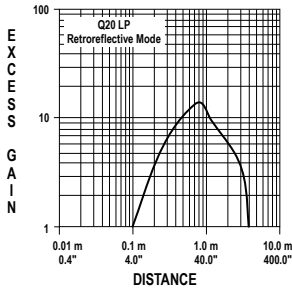


Beam Pattern

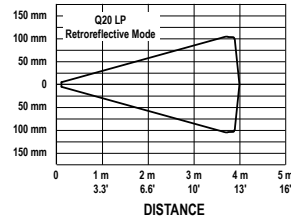


Retroreflective Mode Models (based on retroreflector BRT-84)

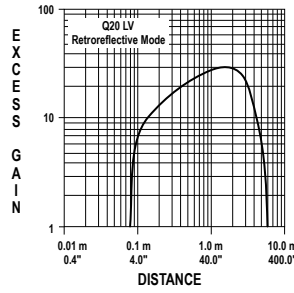
Excess Gain



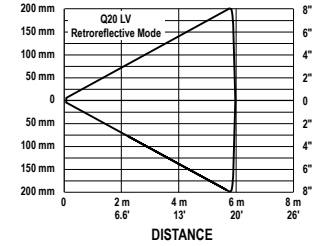
Beam Pattern



Excess Gain

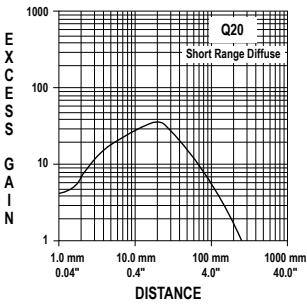


Beam Pattern

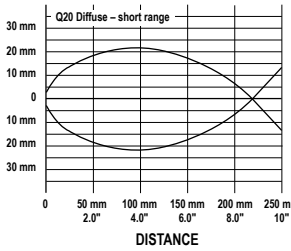


Diffuse Mode Models (based on 90% reflectance white test card)

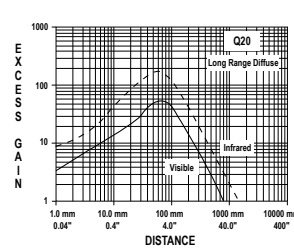
Excess Gain



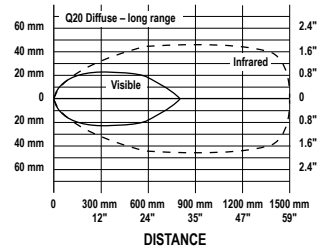
Beam Pattern



Excess Gain

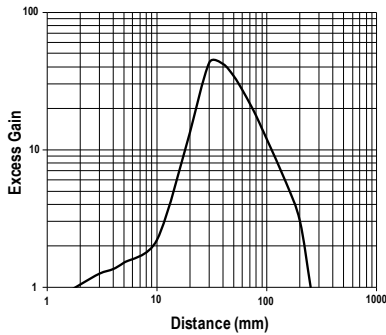


Beam Pattern

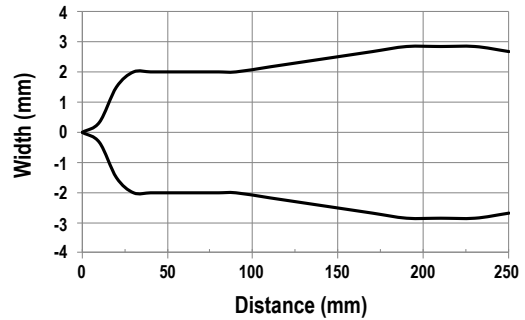


Q20DVS Models

Excess Gain



Beam Pattern



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

