Color Sensitivity

The effects of object reflectivity on cutoff distance, though small, may be important for some applications. It is expected that at any given cutoff setting, the actual cutoff distance for lower reflectance targets will be slightly shorter than for higher reflectance targets (see Figure-of-Merit information on page 5). This behavior is known as color sensitivity.

For example, an excess gain of 1 (see page 5) for an object that reflects 1/10 as much light as the 90% white card is represented by the horizontal graph line at excess gain = 10. An object of this reflectivity results in a far limit cutoff of approximately 20 mm (0.8"), for the 25 mm (1") cutoff models for example; thus 20 mm represents the cutoff for this sensor and target.

These excess gain curves were generated using a white test card of 90% reflectance. Objects with reflectivity of less than 90% reflect less light back to the sensor, and thus require proportionately more excess gain in order to be sensed with the same reliability as more reflective objects. When sensing an object of very low reflectivity, it may be especially important to sense it at or near the distance of maximum excess gain.

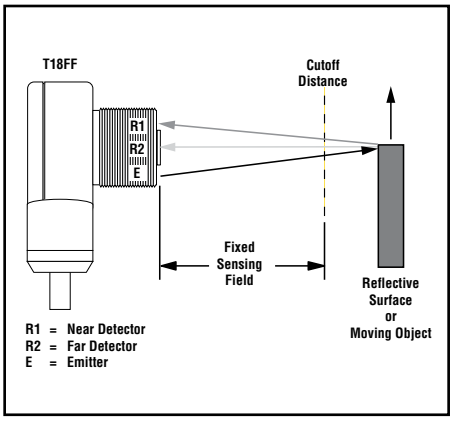

Figure 3. Reflective background – problem

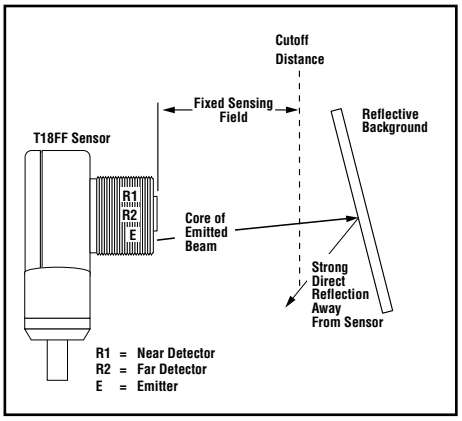

Figure 4. Reflective background – solution

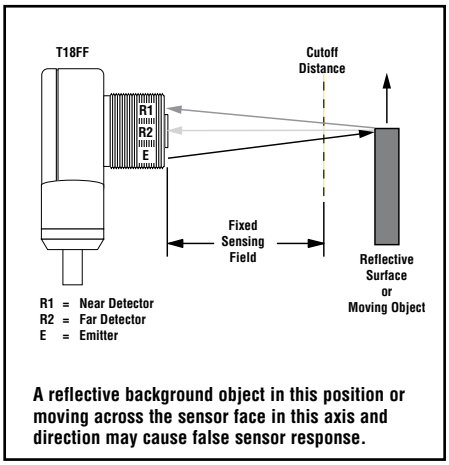

Figure 5. Object beyond cutoff – problem

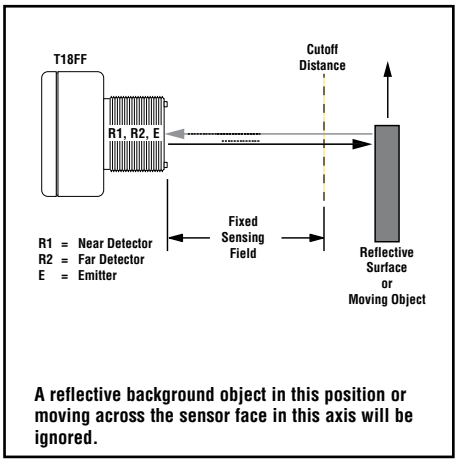

Figure 6. Object beyond cutoff – solution

Specifications

Supply Voltage and Current	20 to 250V ac (50/60 Hz) **Average current:** 20 mA **Peak current:** 200 mA @ 20V ac, 500 mA @ 120V ac, 750 mA @ 250V ac
Supply Protection Circuitry	Protected against transient voltages
Output Configuration	SPST solid-state ac switch; three-wire hookup; light operate or dark operate, depending on model *Light Operate:* Output conducts when sensor sees its own (or the emitter's) modulated light *Dark Operate:* Output conducts when the sensor sees dark
Output Rating	300 mA maximum (continuous) **Fixed-Field models:** derate 5 mA/°C above +50° C (+122° F) **Inrush capability:** 1 amp for 20 milliseconds, non-repetitive **OFF-state leakage current:** < 100 microamps **ON-state saturation voltage:** 3V @ 300 mA ac; 2V @ 15 mA ac
Output Protection Circuitry	Protected against false pulse on power-up
Output Response Time	**Opposed mode:** 16 milliseconds ON, 8 milliseconds OFF **Other models:** 16 milliseconds ON and OFF NOTE: 100 millisecond delay on power-up; outputs do not conduct during this time.
Repeatability	**Opposed mode:** 2 milliseconds **Other models:** 4 milliseconds Repeatability and response are independent of signal strength.
Adjustments	Non-polarized retro and diffuse models (only) have a single-turn rear-panel Sensitivity control (turn clockwise to increase gain).
Indicators	Two LEDs (Green and Yellow) **Green ON steady:** power to sensor is ON **Yellow ON steady:** sensor sees light **Yellow flashing:** excess gain marginal (1 to 1.5x) in light condition
Construction	PBT polyester housing; polycarbonate (opposed-mode) or acrylic lens
Environmental Rating	Leakproof design rated NEMA 6P, DIN 40050 (IP69K)
Connections	2 m (6.5') attached cable or 4-pin Micro-style quick-disconnect fitting
Operating Conditions	**Temperature:** -40° to +70° C (-40° to +158° F) **Maximum relative humidity:** 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06" acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
Certifications	CE, CSA®, UL LISTED