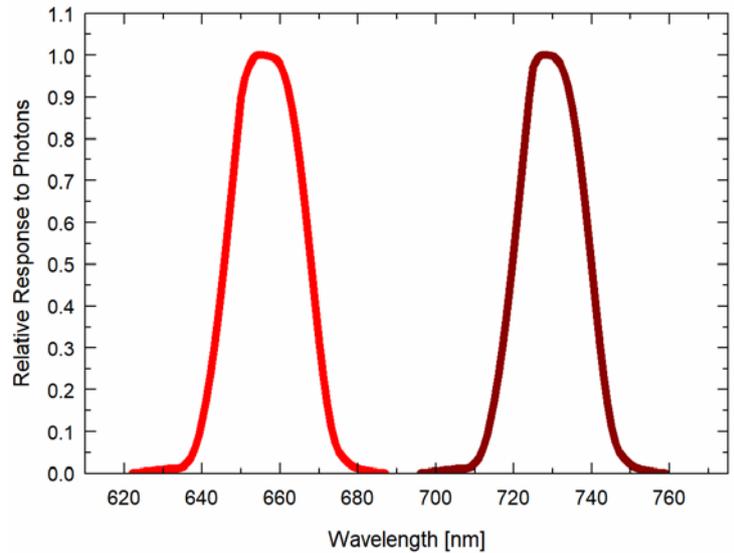


## RED - FAR-RED SENSORS

S2-131-SS, S2-431-SS, & S2-432-SS

## Spectral Response



Spectral response of Red detector (red) and Far-red detector (maroon).

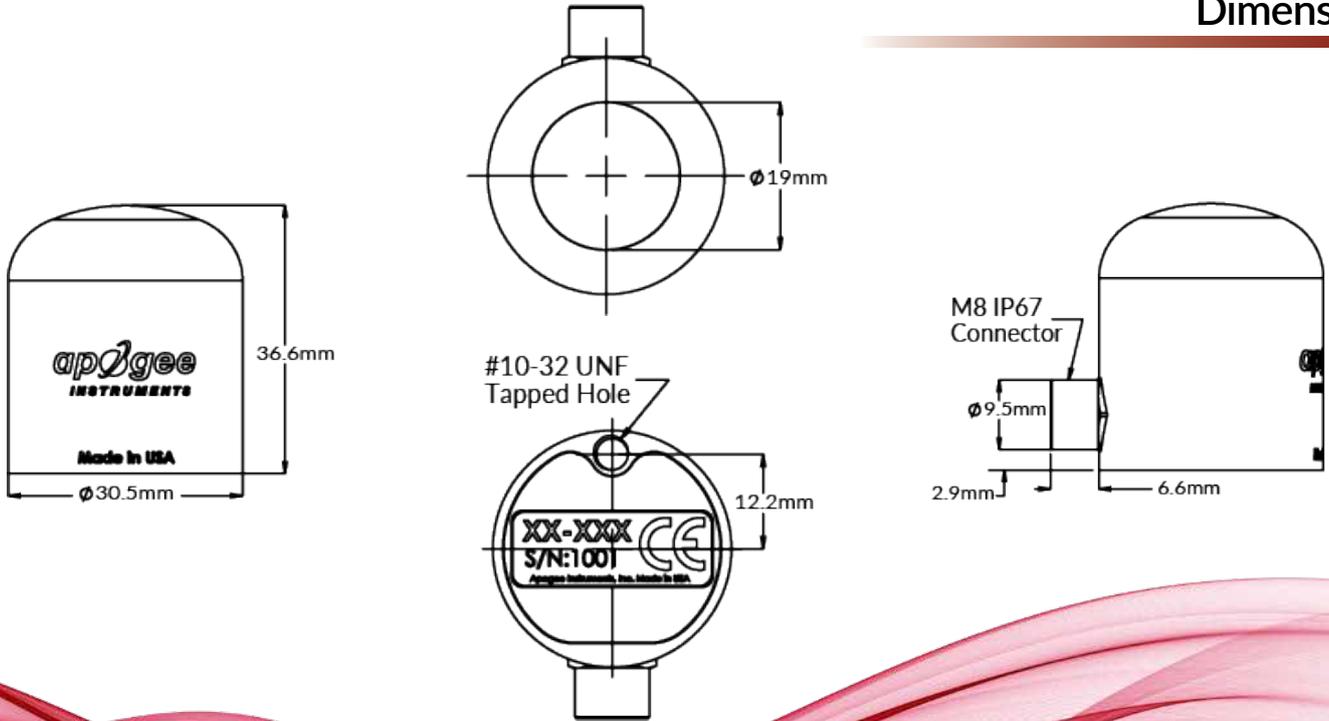
## Product Specifications

	S2-131-SS	S2-431-SS	S2-432-SS
Power Supply	Self-powered	5.5 to 24 V DC	
Current Draw	–	1.4 mA (quiescent), 1.8 mA (active)	RS-232 37 mA; RS-485 quiescent 37 mA, active 42 mA
Output (sensitivity)	0.08 mV per $\mu\text{mol m}^{-2} \text{s}^{-1}$ (typical value, variable from sensor to sensor)	–	
Calibration Factor (reciprocal of sensitivity)	12 $\mu\text{mol m}^{-2} \text{s}^{-1}$ per mV (typical value, variable from sensor to sensor)	Custom for each sensor and stored in firmware	
Calibration Uncertainty	± 5 %		
Output Range	0 to 33 mV	SDI-12	Modbus
Measurement Repeatability	Less than 1 %		
Long-term Drift	Less than 2 % per year		
Non-linearity	Less than 1 % (up to 400 $\mu\text{mol m}^{-2} \text{s}^{-1}$ )		
Response Time	Less than 1 ms	Less than 0.6 s	–
Field of View	180°		
Spectral Ranges (see graph)	645 to 665 nm ± 5 nm (Red) 720 to 740 nm ± 5 nm (Far-red)		
Directional (Cosine) Response	± 2 % at 45°; ± 5 % at 75° zenith angle		
Temperature Response	Less than 0.1 % per C		
Housing	Anodized aluminum body with acrylic diffuser		
IP Rating	IP68		
Operating Environment	-40 to 70 C; 0 to 100 % relative humidity		
Dimensions	30.5 mm diameter, 37 mm height		
Mass (with 5 m of cable)	140 g		
Warranty	4 years against defects in materials and workmanship		

## Overview

Apogee Red - Far-Red sensors combine two photodetectors designed to measure wavelength ranges and peaks that approximate phytochrome absorption. The red / far-red ratio can be calculated from these measurements. Red and far-red wavelengths are of particular interest because they influence photosynthetic and morphogenic activity. Phytochrome pigments sensitive to varying ratios of red and far-red light provide information to the plant about its light environment.

## Dimensions



## Features

### TYPICAL APPLICATIONS

- Monitoring plant light environments
- Research plant morphogenic activity
- Photobiology studies

### KEY FEATURES

Digital SDI-12 output is standard with analog and Modbus options available. A domed diffuser promotes self-cleaning to minimize errors from dust and debris.

### HIGH QUALITY CABLE

Pigtail-lead sensors feature on IP68, marine-grade stainless-steel cable connectors attached directly to the sensor head to simplify sensor removal for maintenance and recalibration.

