

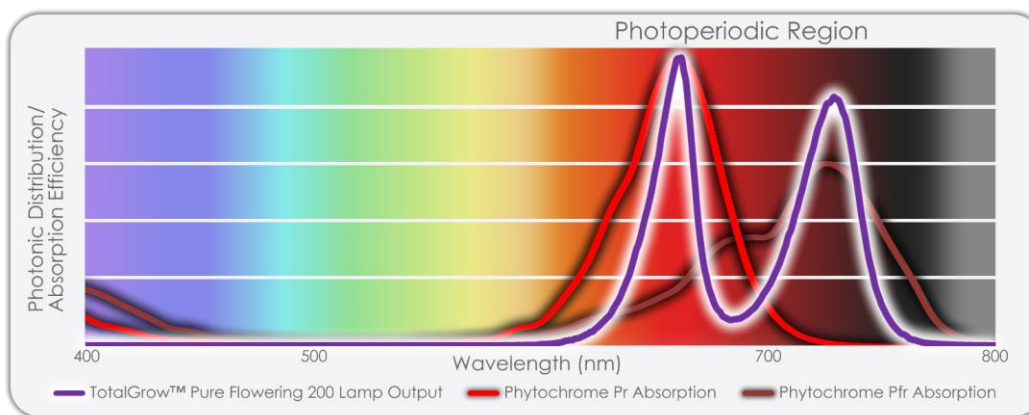
TotalGrow™ Pure Flowering 200 Lamp



The most efficient and effective solution for photoperiodic lighting to control the timing of flowering.

- Perfect balance of red and far-red light output for night interruption/day length extension
- No wasted light output in non-photoperiodic regions
- Minimal power consumption and electrical infrastructure needs with simple installations

The Science of Photoperiodic Lighting



- Long or short day perception often triggers or prevents key behaviors, especially flowering vs. vegetative growth.
- Long days require the appropriate lighting spectrum extending the day before sunrise/after sunset or interrupting the night, e.g. 10pm – 2am, to keep dark periods less than 10 hours.
- The spectrum must properly activate the photoreceptor phytochrome with red (esp. 620-690nm) and far-red (esp. 690-750nm) light as shown above. A ratio of approx. 1:1 for red : far-red light is the only universally effective ratio for photoperiodic lighting.¹
- While usually still effective, higher far-red proportions induce stretching and lower quality crops.²

Item	TG1B-3A-1104
Product Type	Light Bulb
Power Consumption	16W
Projected Service Life	30,000 hours
Photon Flux Output	32 $\mu\text{mol/s}$
Output Efficiency	2.0 $\mu\text{mole/J}$
Typical Coverage	200 sq. ft.
Waterproof	IP65

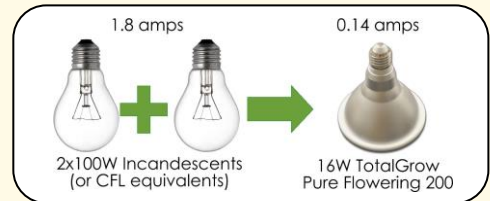
contact: info@venntis.com

¹ Craig, D. S., & Runkle, E. S. (2013). A Moderate to High Red to Far-red Light Ratio from Light-emitting Diodes Controls Flowering of Short-day Plants. *JASHS*, 138(3), 167-172.

² Cerdán, P. D., & Chory, J. (2003). Regulation of flowering time by light quality. *Nature*, 423(6942), 881-885.

TotalGrow™ Pure Flowering 200 Lamp Usage Guidelines

1. Replace 200W of incandescent lights or their CFL equivalents per Lamp.
2. For new installations, install lights on approx. 14' centers with the first light 5' from the grow area edge. Contact info@venntis.com for variations.
3. Hang at heights approximately 60% - 70% of the distance between bulbs (e.g. 8-10' high for 14' lamp spacing).
 - a. For small installations (e.g. 1-2 lines of lights) keep heights around 8' for improved light localization
 - b. For large installations (e.g. 6+ lines of lights) use higher heights of 9'+ for maximum uniformity.



Competition Analysis

Incandescent

- High energy costs and electrical infrastructure costs
- Excessive far-red light causes undesirable stretching
- Burns out quickly & easily broken

Compact Fluorescent

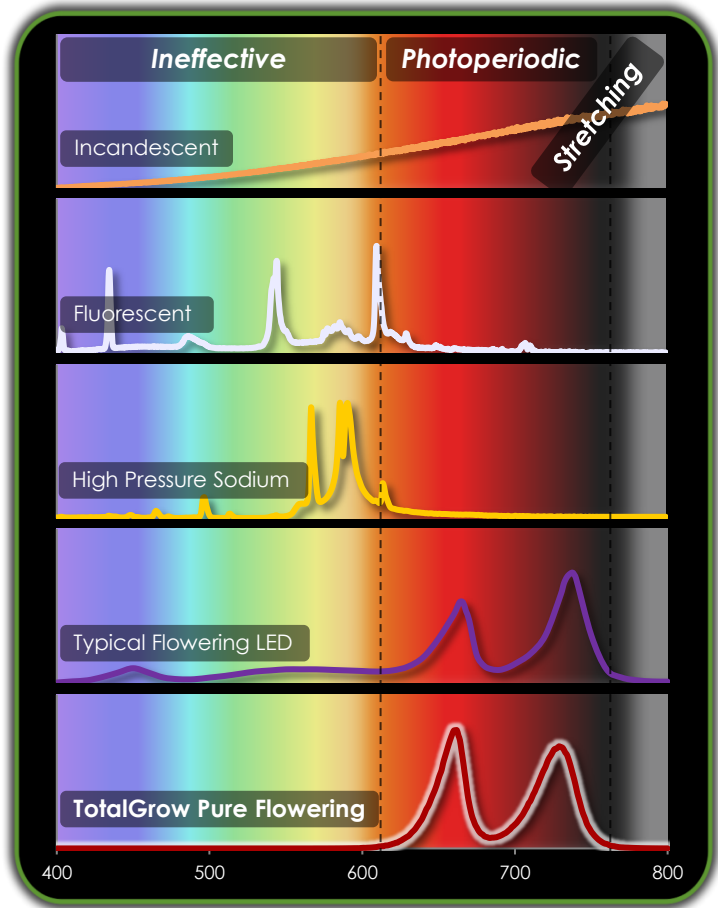
- Insufficient red and especially far-red light output for effective day length control
- Limited efficiency and lifetime
- Toxic mercury vapors in easily broken glass

High Pressure Sodium

- Insufficient red and especially far-red light output for efficient, effective day length control
- High powered bulbs waste light in high-intensity hot spots

Competitor LEDs

- Less precise spectra waste output in blue and green regions and/or miss ideal red : far-red ratios for universal effectiveness with minimized stretching
- Less rugged designs may degrade or break long before LED lifespans
- Usually not waterproof
- Typically ½ the coverage of Pure Flowering 200 Lamps



Features

- Ideal spectrum for photoperiodic flowering control
- Best efficiencies available
- Excellent uniformity potential
- No toxic heavy metals or thin glass
- Long, high durability, waterproof lifetime

Benefits

- Typically over 90% power savings
- Huge electrical infrastructure savings
- Consistent flowering and growth control
- Environmentally friendly; no safety risks
- Little or no maintenance
- Peace of mind from extreme reliability