

# Xenon Lit Plant Growth Chamber



## Specifications

|                           |  |
|---------------------------|--|
| <b>Chamber Model</b>      | PGR15 reach-in chamber   |
| <b>Controller</b>         | Conviron CMP6050   |
| <b>Application</b>        | Accurately evaluate the UV stress response of a chemical product on live subject plants when exposed to intense sunlight |
| <b>Temperature Range</b>  | 4-40°C Lights OFF; 15-40°C Lights ON   |
| <b>Humidity Range</b>     | 35-80% RH lights ON/OFF  |
| <b>Growth Area</b>        | 16.1ft <sup>2</sup> (1.5m <sup>2</sup> )   |
| <b>Growth Height</b>      | 56" (1.42m) from Unifloor® to underside of xenon lamps   |
| <b>Growth Volume</b>      | 78ft <sup>3</sup> (2220l)  |
| <b>Airflow</b>            | Vertical / Upward  |
| <b>Electrical Service</b> | 120-208v, 3Ø, 4-WIRE + GND   |
| <b>Lighting</b>           | Three 6.5kW xenon water-cooled lamps   |

Prolonged exposure to sunlight can cause deterioration of most industrial-produced materials, coatings and chemical compounds. Accelerated testing using a simulated UV light source in a growth chamber makes it possible to determine the lifespan and environmental fate of compounds when applied to plants. Though typical non-barriered fluorescent lights provide a small amount of UV, it is nowhere near the UV radiance found outdoors in natural light. The use of an ultraviolet-rich light source, such as a xenon lamp, is very useful in replicating long term sun exposure as closely as possible.

A xenon arc source has the closest spectral power distribution to natural sunlight. In particular, the UV profile below 400 nm and spectral distribution over the photosynthetic active range (PAR) is as near a match to open sunlight as possible from a commercially available light source. It is this particular light source that allows researchers to accurately evaluate the UV stress response of a chemical product on live subject plants when exposed to intense sunlight. Other sources of UV such as specialized LEDs or UV fluorescents have not yet been developed to deliver the intensity or spectral distribution of natural sunlight.

Conviron was able to integrate the ultraviolet-rich light source of xenon lamps into a controlled environment that enabled the accurate assessment of the effects of sunlight on chemical products. Conviron worked closely with the client to understand their requirements and subsequently develop a chamber based on the PGR15 reach-in design. The chamber incorporates three 6.5kW water-cooled xenon lamps with a custom-made power driver and water-cooling cabinet. Each xenon lamp is programmed using Conviron's CMP6050 control system, which provides independent on-off scheduling for each xenon lamp. ▶▶



Conviron PGR15 reach-in chamber with lamp cooling cabinet and external power supply



Airflow for the PGR15 is distributed uniformly upward using Conviron's Unifloor® air distribution plenum. The chamber uses a water-cooled direct expansion refrigeration system with a water-cooled, hermetically sealed condensing unit for cooling. An independent chilled water supply cools the Xenon cabinet and lamps by feeding the primary side of a heat exchanger for each lamp. In addition, the secondary lamp cooling circuit uses an isolated reservoir to circulate purified water to each lamp water jacket.

At each lamp, a quartz/borosilicate glass filter is installed to minimize radiant heating of the plants. The inner and outer quartz filters forming the lamp water jacket are selected to tune the UV profile to a historical sunlight reference at a known location.

Much like metal halide lamps, xenon arc lamps have a high internal pressure and safety precautions are vital to prevent exposure to UV radiation and the high voltage electrodes found at the end of each lamp. If a door opens during operation, sensing switches (provided on each chamber door) are triggered and the controller turns off all lamps automatically.

Each lamp has a remote controlled adjustable shelf to change the distance from samples to lamps without opening the chamber. Removable partitions between light zones enable the entire chamber to be used as one homogeneous zone. With the partitions in, three individual UV light exposures are possible.

## About Conviron

Established in 1964, Conviron is the world's leading supplier of controlled environment systems for plant science and agricultural biotechnology research. From small reach-in chambers to full-scale growth houses, and custom solutions – Conviron systems can be found in small start-up facilities to many of the world's largest and most prestigious research institutions in over 90 countries.

Conviron's global sales, distribution and service network offers a comprehensive suite of value-added services that encompass the entire life-cycle of your project - from early-stage design through to installation, project commissioning, on-going maintenance, support and technology upgrades.

**Conviron - Head Office**  
Winnipeg, Canada  
Toll Free: 1-800-363-6451

**Conviron GmbH**  
Berlin, Germany  
Tel: +49 (0) 30-367 00660

**Conviron - US**  
Pembina, USA  
Toll Free: 1-800-363-6451

**Conviron - China**  
Shanghai, China  
Tel: +86 21-62147582

**Conviron Europe Ltd.**  
Cambridgeshire, UK  
Tel: +44 (0)1638 74 1112

**Conviron - Australia**  
Melbourne, Australia  
Tel: 1300 438 912

[www.conviron.com](http://www.conviron.com)  
[info@conviron.com](mailto:info@conviron.com)



Management System Certified to ISO 9001

Rev.:2, July 2017 | MK0032

©2017 Controlled Environments Limited. Conviron is a registered trademark of Controlled Environments Limited. All other trademarks are the property of their respective owners. Information subject to change without written notice.