poly klima
Climatic Grow Systems

Fact Sheet Growth Chamber X-2

At a glance

Your benefits

- ✓ **Made in Germany** - parts and construction of high quality for high durability.
- ✓ **Energy efficiency** - refrigeration plant and lighting provide optimal energy efficiency.
- ✓ **Non corrosive** - all metal materials are galvanized and durable plastic-coated.
- ✓ **High level of standard fitting:**
  - Each lamp bank is dimmable separately in 0,5% steps as a standard.
  - Chamber parameters can be controlled and programmed with an industry-standard touch panel.
  - Each chamber comes with LAN connectivity as a standard for remote programming, parameter control and data logging. This also enables remote diagnosis und -service.
- ✓ **Sophisticated construction** - We build the chambers at site out of 6 single pieces. Therefore low or narrow doors are no issue.

Measurements

- ✓ **Overall dimension** - 970 x 1.600 x 2.100 mm (D x W x H).
- ✓ **Inner dimensions** - 1,6m² working area on 2 tiers, 75 cm growing height per tier.
- ✓ **Temperature** - from +7°C (without light) resp. +10°C (with light) up to +44°C, given a maximum temperature variance of ±0,5°C.
- ✓ **Air conditioning** - energy-efficient refrigeration system with hot-gas bypass-control and RPM-controlled ventilation fans.
- ✓ **Flexible lighting:** the lamp banks are dimmable sperately in 0,5%-steps and fitted with
  - compact TL-D fluorescent lamps with either
    - 5 to 250 µmol/m²/s or
    - 8 to 400 µmol/m²/s or
    - 15 to 650 µmol/m²/s or
    - 200 to 1.000 µmol/m²/s (also with CDM-T lamps available)
    - optional enhancement of spectrum with red and infrared LEDs or
  - lamp bank loaded completely with polyphoLED panels with light colors blue, white, red and infrared. Further different light colors possible.
- ✓ **Intuitive and comfortable operation** - industry-standard 12"-touchscreen at the chamber or remotely via standard network connection.

General

poly klima® is a young and innovative subsidiary company of Heinz Hofmann & Sohn GmbH, which for four generations has stood for sustainable solutions in terms of construction and installation of refrigeration plants and customized climatic chambers.

poly klima® designs and builds custom-made climatic rooms and growth chambers for environmental simulation for various research fields at universities and institutes.

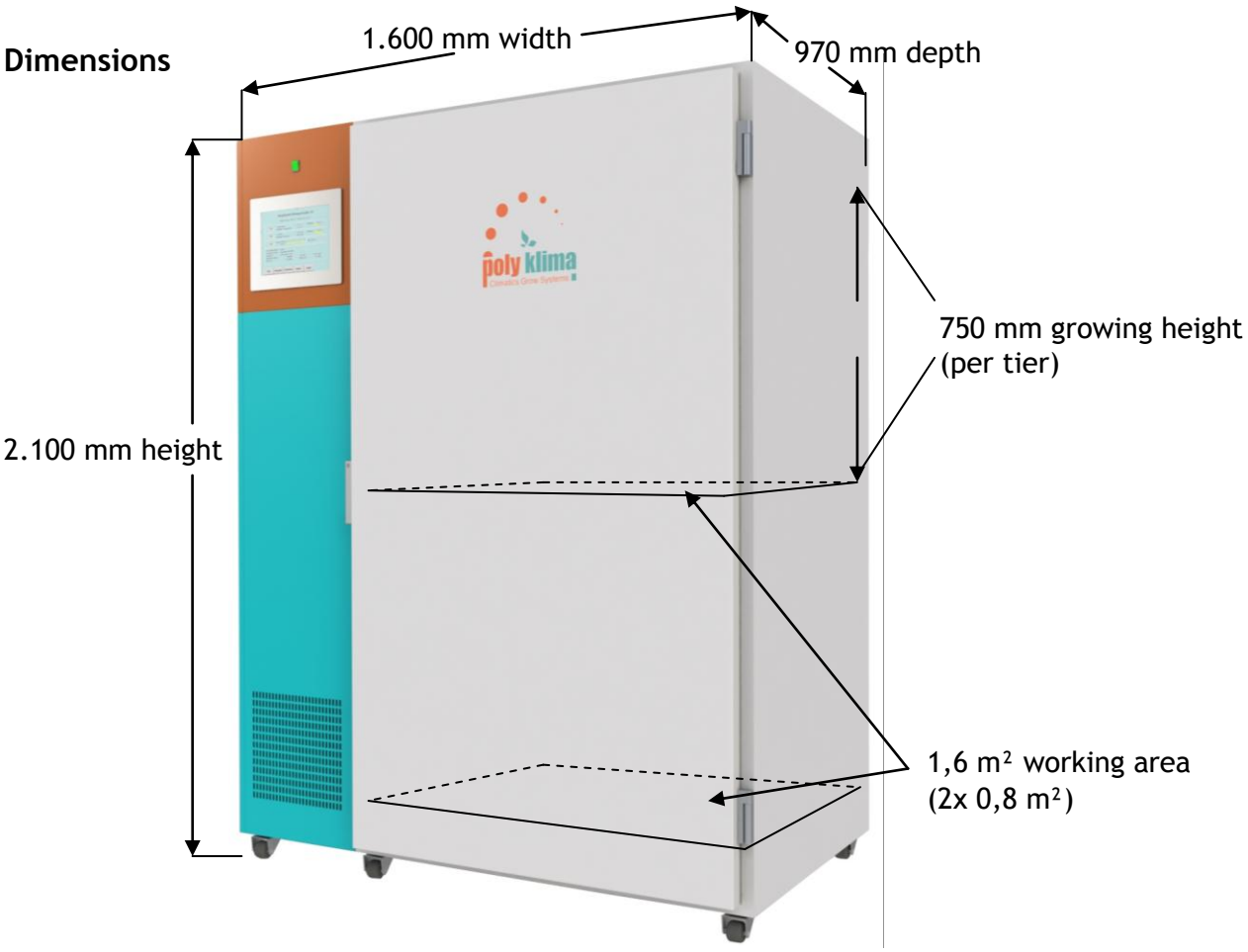
The X-series growth chambers from poly klima® excel with their spacious inside in conjunction with their relative compact overall dimensions.

poly klima® growth chamber X-2

The poly klima® growth chamber X-2 was developed for biological applications like the research with plants that need a bigger growing height like corn or other cereal plants. But also Arabidopsis or Drosophila is comfortable in it. Due to its flexibility this chamber is also good for materials research and other similar fields of application. It provides ideal and stable conditions for scientific research and various other thinkable applications.

Model X-2 is loaded with 2 lamp banks and 2 shelves, all vertically adjustable. The shelves consist each of 7 parts which can be taken out individually.

Dimensions



Design

All metal parts used are galvanized and coated with white, reflective durable plastic. Therefore corrosion is not possible. The inside of the chamber is coated with white, reflective plastic. This guarantees an optimal light distribution.

The chamber walls, the floor, the top cover and the door are made of steel sheet metal which is polyurethane foamed without any thermal bridges. Placed on the chamber floor there is a steel trough with a condensate drain. The chamber door is lockable.

One shelf consists of several single pieces, which can be pulled out individually and so provide more flexibility in terms of designing your working area (e.g. different height levels)

The chamber is made of 6 single pieces and can be built at site easily. Therefore narrow or low doors are no issue.

The chamber is placed on (braked) casters and can be moved easily.

Air Conditioning

Air-cooled or water-cooled refrigeration system, extremely energy-efficient with hot-gas control and RPM-regulated ventilation fans, which minimizes energy consumption of the chamber and wind stress for your experiments.

The air inside is travelling horizontal through a perforated back-plate over the shelves and is sucked up vertically to the ventilation fans and the evaporator, where it is air-conditioned and led back to the air-tunnel in the back wall.

The airflow is adjustable in every tier with the help of moveable steel sheets assembled to the back wall. As a result you get best possible temperature uniformity in the whole chamber.

For the compressor ventilation grill there should be at least 10 cm free space next to the technical compartment.

Condensation water is led out of the chamber through a drain in the chamber floor. From the integrated ¾" hose fitting it can be led away to a floor drain or a condensate pump.

Temperature

Standard temperature range: +7/+10 °C (with/without lighting) up to +44°C, given a maximum temperature variance of ±0,5°C. Wider temperature ranges are of course possible as an option.

Lighting

Energy saving, compact fluorescent tubes, light color 840 (neutral white) with very good performance and therefore energy efficiency throughout the chambers temperature range. Especially in the low temperature range there is no significant decrease of light intensity observable. For higher light intensities we use CDT-M metal halide lamps.

The thorough and equidistant arrangement of the lamps on the light fixtures in conjunction with the white, reflective and durable plastic coating inside the compartment ensures excellent light homogeneity over the whole growing area. There is no “fall-off” in the margin areas.

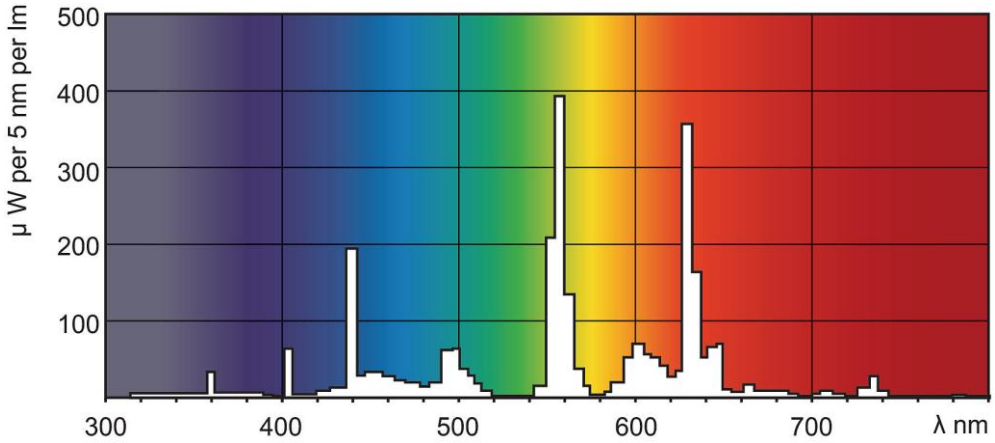
The lamp banks are dimmable in 0,5% steps as a standard.

There are 4 intensity groups to choose from (intensities measured at 15 cm distance):

a.) 5 to 250 µmol/m²/s b.) 8 to 400 µmol/m²/s c.) 15 to 650 µmol/m²/s
d.) 200 to 1.000 µmol/m²/s

Of course light intensities are customizable according customer wishes!

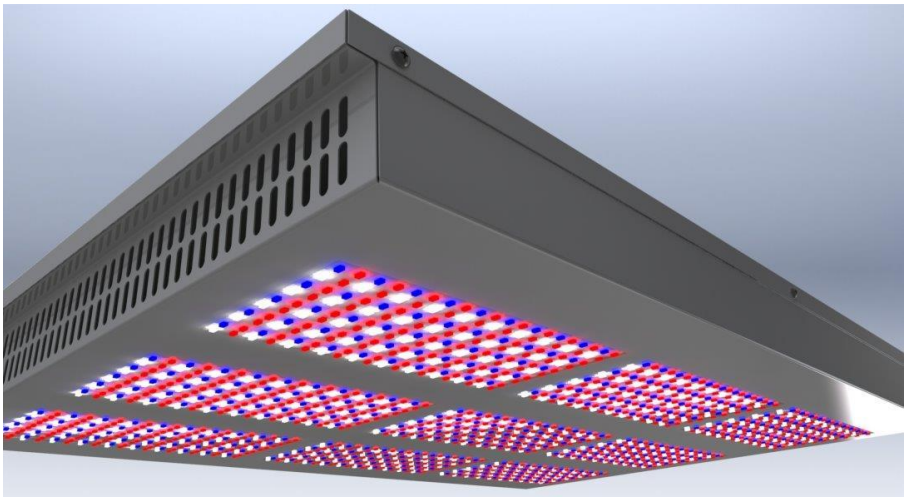
The fluorescent tubes used show a broad light spectrum that contains all wave length important for growing plants.



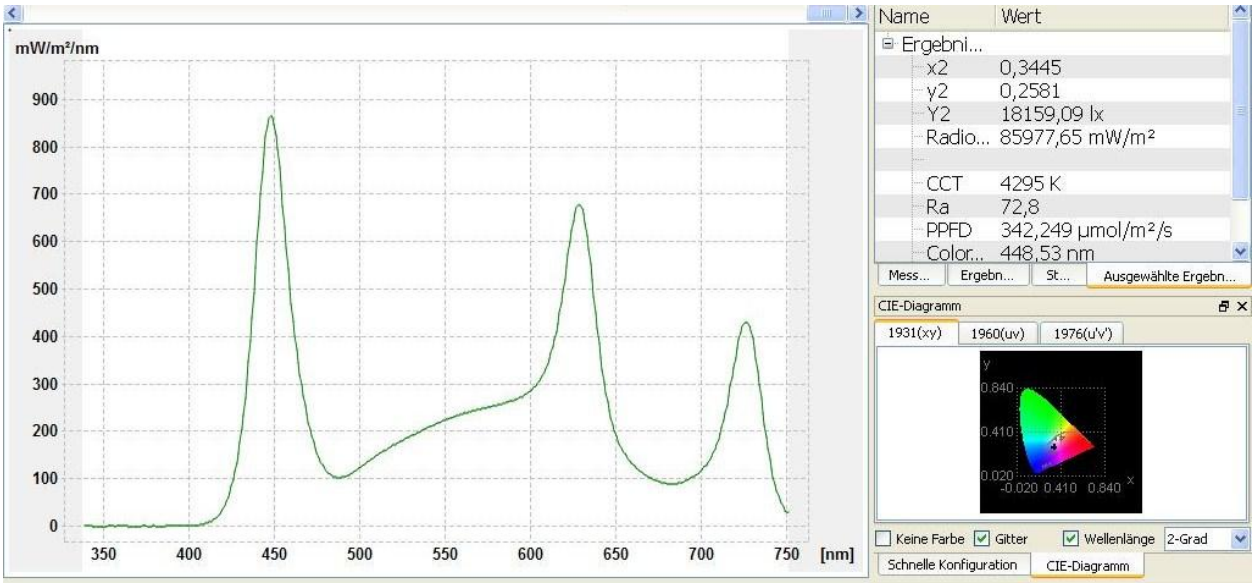
Light spectrum of a fluorescent tube, light color 840, 36 Watt (Philips Inc.)

For enhancement of the photosynthetically active radiation (PAR) the lamp banks can optionally be equipped with additional, separate dimmable red- (660 nm) and infrared-LEDs (730 nm).

Instead of the standard fluorescent lamps (or metal halide lamps) the lamp banks can be fitted with our LED-panels **polyphoLED**. For constructional reasons the lamp banks then are fixed in height.



A lampbank of a M-type chamber, fitted with 9 polyphoLED panels, equipped with LEDs in the light colors blue, white, red and infrared.



Color spectrum graph of a polyphLED panel with blue, white, red and infrared LEDs.

Of course you can choose from further color channels. Overall there are up to 20 channels possible. The LED-panels are dimmable from 100% down to 0,01% in 10.000 single steps!

Operation

Chamber parameters can be controlled and programmed with a high-grade industry-standard touch panel on the chamber or a remote computer. The 12" graphic display ensures a quick and intuitive programming and shows all actual and nominal values.

With the visualizing software on every access-authorized windows-based computer in the network all parameters can be displayed, edited and programmed comfortably.

All alarm messages will be shown in text-messages on the touch panel and additionally be forwarded via E-Mail or SMS.

Options

- Ultrasonic humidification for humidity levels inside the chamber up to 85% r.H. (±10%, depending on ambience humidity and light level inside the chamber).
- Reservoir humidification for Entomology, to prevent interference with reared insects by ultrasonic.
- Dehumidification with additional heater inside the top mounted evaporator unit for humidity levels down to 45% r.H. (±10%, depending on ambience humidity and light level inside the chamber)
- Gas application for chamber inside with CO_2 or O_2.
- Entomology package: coated evaporator, refrigerant tubes of V2A-steel, filter in front of the ventilation fans inside the chamber.

- Low temperature: -10°C (±1°C; with/without light). Either with periodic defrost or double-evaporator (please note that with this option the chamber height increases for constructional reasons). Please contact us in this case!

- High temperature: +55°C /+60°C (±1°C) for decontamination inside the compartment.

- Door-window with or without light tight cover.

- Glass door, e.g. for passive illumination of the rearing compartment.

- See-through inner doors for thermal cording off of the chamber inside, even with doors open.

This is just an extract of the most important options. Our chambers are practically customizable to every requirement. We look forward your challenge!

Contact

We appreciate your interest and your questions!
Just give us a phone call or drop us an Email.

We are glad to offer advice and help at any time!

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