3010-GWK1: Gas-Exchange Chamber

DESCRIPTION

The Gas-Exchange Chamber 3010-GWK1 is designed to investigate medium-sized samples like small branches, big leaves, or fruits under well-defined climate controlled conditions. To provide this, the 3010-GWK1 chamber has a highly efficient temperature control, a transversal fan for fast ventilation, and pneumatic connectors for air-supply.

Internally there are sensors to accurately monitor temperature at three sites, air humidity, and PAR (photosynthetically active radiation). Externally the chamber has additional sensors for temperature and PAR.
The LED-Panel RGBW-L084 provides illumination for the Gas-Exchange Chamber 3010-GWK1. It has a densely packed array of high-power color-LEDs for uniform light distribution. Individual adjustable colors Red, Green, Blue and White exhibit together a maximum output of 2000 µmol s^{-1} m^{-2} or better.

3010-GWK1
Gas-Exchange Chamber

- For CO_2 gas-exchange measurements, the chamber can be operated as part of the GFS-3000 in replacement of the Standard Measuring Head 3010-S. Otherwise the chamber can be operated directly by a computer using an optional interface. On request, the top part of the chamber will be manufactured to match the requirements for particular samples.
- Gas-Exchange Chamber 3010-GWK1 to be considered in combination with the GFS-3000, that the maximum flow of the GFS-3000 is 1.9 l/min. Leaf samples producing too much humidity can limit the systems capabilities.
- The 3010-GWK1 also facilitates the option of studying spatially resolved chlorophyll fluorescence under defined conditions, because its sample area matches the imaging area of the IMAGING-PAM M-Series MAXI version.

3010-GWK1

ACCESSORIES

- **LED-Panel RGBW-L084**
  LED-Panel RGBW-L084 with a densely packed array of high-power color LEDs features various illumination options. See also 3010-GWK1 & LED-Panel.

- **Interface 3010-I/GWK**
  Interface for the operation of the Gas-Exchange Chamber 3010-GWK1 with a computer and the GFS-Win software.

- **Chamber**
  Chambers can be designed on customer request, for example a fruit chamber.

General Features

Temperature
The 3010-GWK1 chamber is equipped with four temperature sensors: Three Pt100-type sensors measuring temperature of inside air, near the cooling elements and externally. The fourth temperature sensor is a thermocouple for leaf temperature measurements.

Temperature Control Modes
Temperature control can be switched between three modes: Constant temperature of chamber air, constant leaf temperature, or temperature variation parallel to ambient temperature with an adjustable offset. Temperature profiles can be realized with user-programs. Due to the highly efficient Peltier technology, the cuvette temperature can be regulated fast and accurately.

Light
The 3010-GWK1 chamber has two sensors for photosynthetic active radiation (PAR): A cosine corrected sensor (MQS/B-GWK1) measures ambient PAR at sample level outside the chamber, and a special miniaturized sensor measuring PAR inside the chamber.

Humidity
A maintenance-free sensor measuring the relative humidity with an accuracy ±1.5% RH. is located inside the gas-exchange chamber.

Ventilation
The gas-exchange chamber features a transversal fan for effective ventilation. Its speed is adjustable in 10 steps.

Operation
The 3010-GKWK1 chamber can be controlled by the GFS-3000 or by a laptop using an optional interface. In both configurations, the 3010-GKWK1 chamber requires its own power supply.

Specifications

- Chamber consisting of an aluminum cooling block with two pneumatic connectors and transversal fan, flat polymer lid or user-designed cuvette; micro-processor controlled electronics with connectors for temperature sensors, humidity sensor, PAR-sensors, GFS-3000 or 3010-I/GWK connection, power-input; cooled with Peltier-cooling units and ventilator.

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