

**GC 400**

**GROWTH CHAMBER**



# GC 400

GC 400 Growth Chamber is developed for simulating real environmental conditions by controlling temperature, humidity and day-night lighting cycles. The excellent design of GC 400 allows it to be used for different purposes such as:

- Plant Growth
- Seed Germination
- Acclimation of plants
- Culture of plant cells and tissues
- Genetic manipulations of plants
- Cultivation of protoplasm and cells
- Incubation and rearing of insects
- Any test which needs specific temperature, humidity and illumination



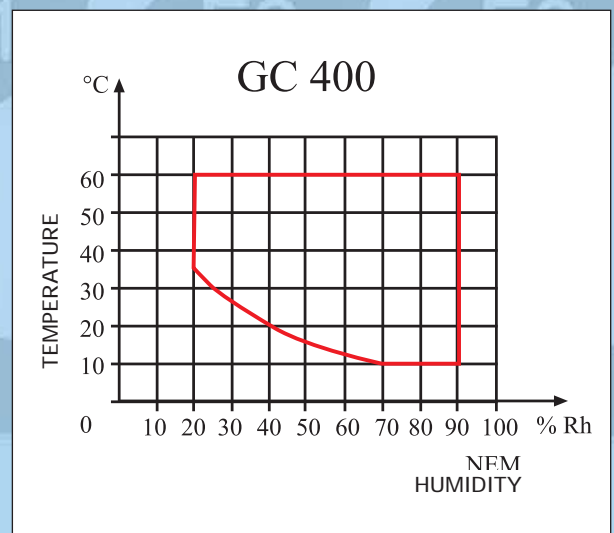
The insulation becomes more important for the efficiency of the product when cold and hot temperatures are concerned. The left, right and upper windows ensure perfect insulation with their double glass. The back side and the door are insulated with polyurethane. Double door seals ensure total insulation of the chamber even under extreme climatic test conditions.

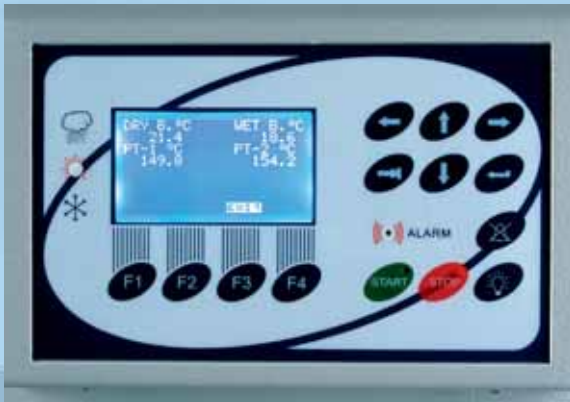
One of the most important features of a growth chamber is the lighting function. The chamber of GC 400 is illuminated from three sides: left, up and right. By means of the three side lighting and by the help of the time control system for each side, the movement of the sunlight is simulated. For each side, lighting can be programmed separately and five different light levels can be chosen.

The humidity is produced by the humidity generator and measured according to psychrometric diagram by means of dry and wet bulb temperatures. As an advantage of the system, the recovery time is fast and humidity measurement is sensitive. The heating is controlled by PID while cooling is controlled proportionally.



For the construction of the product, the right choice of materials was made to ensure maximum durability and reliability. The chamber is made of stainless steel and glass windows. The windows consist of double layer glass and the glass is tempered LOW-E type. Fluorescent lamps, starters and other electrical parts are placed outside the chamber for easy chamber cleaning. The outer body including the door is made of epoxy-polyester coated stainless steel that can resist to high humidity levels.





The state-of-art control system is based on programmable microprocessor technology and it is mounted on the door for the comfort of programming. Easy to use control system allows to program:

- Program name: There are ten program memories.
- Temperature: -20°C / +60°C
- Humidity: 20 % / 95 % Rh
- Lighting: 0 - 24 hours for each side
- Time: 0 - 999 hours 59 minutes and hold position.
- No of step: 1 - 9
- No of program repetition: 1 - 99
- Altitude: It is a must to enter the altitude for calculating the right humidity value according to psychrometric formula.



The control system also contains a comprehensive self-diagnostic system providing information regarding any system failure. The self-diagnostic system warns the user in case of:

- Overheating
- Heater failure
- Circulation fan motor failure
- Cooling system failure
- Water pump failure
- Communication failure
- Power failure
- Temperature sensor failure
- Low water level
- Full reserve tank

User friendly control panel includes 128x64 pixel display. The messages written on the display lead user when making a program. The control system of GC 400 has 32 Kb memory which can be upgraded to 256 Kb as an option.

The auxiliary control panel includes adjustable electronic safety thermostat and the following connections:

- Printer Connection: Previously operated programs in the memory and the current operating program can be printed easily by the connection of a dot-matrix printer.



- RS 232 Connection: GC 400 can be connected to a computer. Optional NuveGrowth software allows to program the instrument and control the operation via computer.

- Power Supply: 230 V power socket allows to operate any equipment inside the chamber (i.e. shaker, stirrer) or outside (i.e. printer, computer) up to 500 W.

Besides all the technical advantages, GC 400 is environmentally friendly with CFC-free insulation and refrigerant.



## TECHNICAL SPECIFICATION

	GC 400
Temperature range without humidity	-20°C / +60°C (lights off)
	0°C / +60°C (lights on)
Temperature range with humidity	10 °C / +60°C
Humidity range	% 20 - % 95 Rh
Temperature set and reading sensitivity	0.1°C
Humidity set and reading sensitivity	%1 Rh
Max, light level	20,000 lux
Lighting timer	0 - 24 hours
Program timer	0 - 999 hours and 59 minutes + hold
No of program memories	10
No of steps	9
No of program repetition	1 - 99
Altitude setting	0 - 2000 meters
Memory capacity	32 Kb
Useful volume	400 liters
No of shelves (standard/max)	2 / 16 pcs.
Internal dimensions (WxDxH) mm	630x630x1010
External dimensions (WxDxH) mm	870x1250x1745
Power consumption	6000 W
Power supply	400 V, 3 phases + N + G, 50 Hz

### ACCESSORIES

R01 114 Shelf  
R01 115 Shelf Support  
P03 566 Shelf Carrier

### OPTIONS

A08 077 Water supply unit  
K13 014 NuveGrowth data control software and RS 232 interface  
E05 073 256 Kb memory



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ISO 9001: 2008  
ISO 13485: 2003

