



Microclima plant

Microclima Plant Growth Chambers



The controlled environment for reproducible results.



The Microclima is superior to its competitors in delivering reproducible plant growth patterns throughout the entire growth cycle.

The Microclima achieves optimum climatic conditions by adjusting the day and night cycle very accurately, e.g moisture, temperature and illumination. The Microclima makes this possible and allows the researcher to extend their research over all stages of plant development: from molecular genetics through to studies in plant physiology; from seed germination to mature growth and flowering (mutations and generations).

Arabidopsis Thaliana is grown in the Microclima Arabidopsis chambers.

Characteristics of the Microclima

- very accurate, reproducible results
- fully programmable, with up to 99 programs and all the features required for today's plant growth research running in real time
- temperature, moisture and illumination adjustable for day and night cycles
- the illumination options range from 400 $\mu\text{E}/\text{m}^2$ to 1200 $\mu\text{E}/\text{m}^2$ max inclusive of dimming and dawn/dusk cycles
- the lamps are housed behind the thermal glass in a lamp loft and all the excess heat is removed by fans to atmosphere
- wide temperature range, from +4 up to +50°C (optional: -15°C to +50°C)
- net growth surface area 0.9 m² (MC1000E) or 1.4 m² (MC1750E), which can be doubled to 1.8 m² and 2.8 m² respectively with the secondary Arabidopsis light rack option
- growth height: 1.2 metre
- universal design to cover all user requirements for in-vivo tests
- potential free contact for remote alarm
- environment friendly and highly energy efficient (CFC-free) cooling system
- many options: see the options section.

Construction features

The exterior of the cabinets is galvanized plate electrolytically coated with epoxy powder in off-white (RAL9002) and blue (RAL5010). The interior is finished in Stainless Steel with white 'Trespa' sheet. The outer door has a key lock and a viewing window with a door, 450 x 650 mm. The mixing fans are in the base of the cabinet, within the pressure plenum (fig.1). These fans return the conditioned air back into the chamber with an air circulation of 0.2 m/s. The chamber is fitted with 2 half width adjustable platforms, made of white polystyrene in a stainless steel frame. Low profile heavy duty casters for mobility.

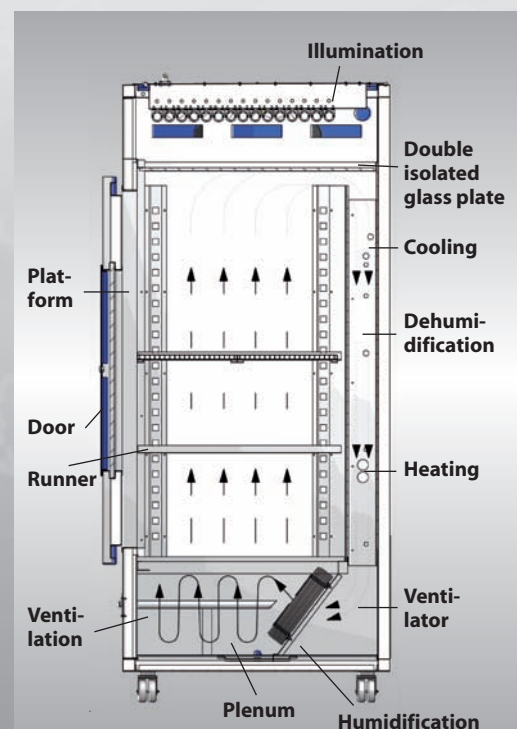


Fig.1 Aircirculation

Control system

The controller, model IMAGO F3000, is a micro-process based controller designed according to the latest technology. It enables the user to control all the functions, required for the modern plant growth cabinets and/or in-vitro growth systems. This F3000 allows for accurate control of a wide range of parameters for example humidity, temperature, illumination, CO₂ and airflow.

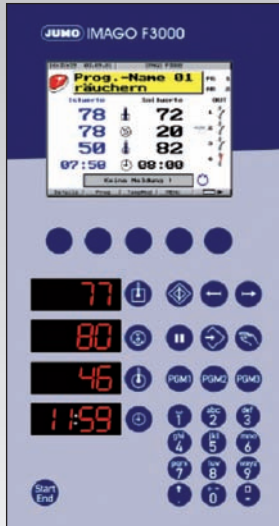


Fig.2

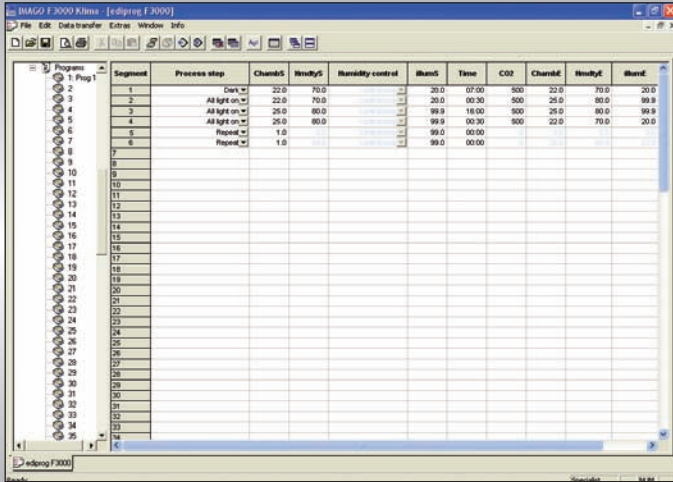
Temperature control

The F3000 controller checks and regulates the set temperature by PID control of the cooling and heating systems. The controller shows both the set and actual values in °C, recorded by means of a PT100 temperature sensor.

Features:

- ease of programming in a spreadsheet format
- CO₂ and dimming displayed if options purchased
- max. 99 programs, each with a max. 99 steps (up to a max. of 3600) running in ramp or step mode in real time
- powerful edit function
- 5 inch multicolor LCD display
- powerful system interrogation functions
- RS422/RS485 interface
- key lock as standard to avoid tampering of settings
- configuration and recording in English. This can be changed to German and French (the standard program terms remain in English)
- running screen shows real time, segment countdown time, program number, running segment, temperature, humidity (actual and set), lights on/off, alarms, heating & cooling valve actions.





Segment	Process step	ChambS	HumidS	Humidity control	HumidE	Time	CO2	ChambE	HumidE	HumidE
1	On	22.0	70.0			07:00	500	22.0	70.0	20.0
2	All light on	22.0	70.0			08:30	500	25.0	80.0	99.9
3	All light on	25.0	80.0			18:00	500	25.0	80.0	99.9
4	All light on	25.0	80.0			00:30	500	22.0	70.0	20.0
5	Reset	1.0				00:00				
6	Reset	1.0				00:00				

Fig. 3.1 Example of program editor

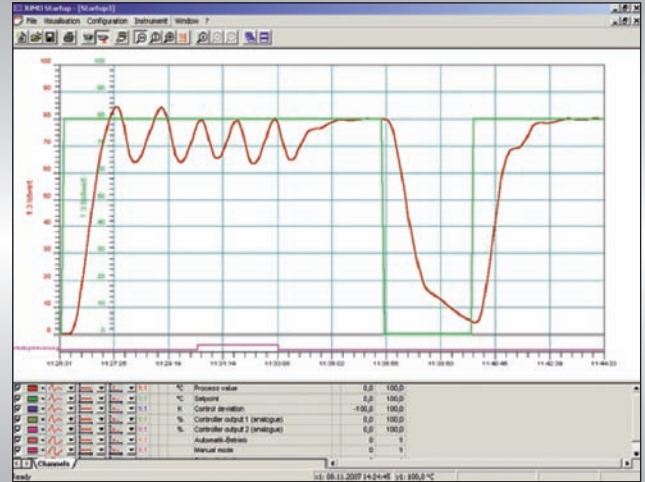


Fig. 3.2 Example of report temperature and humidity

Optional

- automatic logfunction in combination with a registration function
- software to allow the download and recording of temperature and humidity in a graphical or numerical format
- multiple chambers can be linked together and controlled by the PC based SVS 3000 software for networking
- autodialing via the Ethernet
- program editor
- communication interface for MODbus or Profibus-DP

Alarms and safety

- Alarm triggered when the temperature deviates $\pm 5^{\circ}\text{C}$ from set point. The humidity alarm is activated on a deviation of $\pm 5\%$ HR from the set point. The span is adjustable.
- Potential free contact.
- Minimum safety thermostate \rightarrow when activated cooling and dehumidification switches off.
- Maximum safety thermostate \rightarrow when activated heating and lighting switches off.
- Optical alarm led and acoustic alarm buzzer.

Humidity

- The Microclima controller checks and controls the set moisture content (RH) by humidification and dehumidification. An ultrasonic humidifier controls humidification. Dehumidification is controlled by the evaporators.
- The display shows both the set and actual values in percentages via measurements taken with an extensometric humidity sensor.
- A direct connection to the demineralised water supply.

Physical	Microclima MC1000E	Microclima MC1750E
Volume	1000 litres	1750 litres
Interior dim. (wxdxh / mm)	1285x675x1220	1835x775x1220
Growth area	0,9 m ² (1,8 m ² option)	1,4 m ² (2,8 m ² option)
Maximum growing height	1,2 m	1,2 m
Laminar airflow (adjustable)	vertical (max. 0,2 m/s)	vertical (max. 0,2 m/s)
Standard specifications		
Temp. range (light off)	+4°C till + 50°C	+4°C till + 50°C
Temp. range (light on)	+10°C till +50°C	+10°C till +50°C
Temperature fluctuation	0,3°C	0,3°C
Variation (total chamber)	1,0°C	1,0°C
Variation (1 shelf)	0,3°C	0,3°C
Humidity range (dependent on temp./ light)		
40°C	40 – 95%	40 – 95%
30°C	45 – 95%	45 – 95%
20°C	55 – 95%	55 – 95%
Max. humidity (lamps on / off)	90% / 95%	90% / 95%
Lightlevel (on 150 mm)	400 µE/m ² .s (30.000 lux) 600 µE/m ² .s (50.000 lux) 1200 µE/m ² .s (100.000 lux)	400 µE/m ² .s (30.000 lux) - 1200 µE/m ² .s (100.000 lux)
Facilities		
Temperature controller	Microprocessor PID	Microprocessor PID
Temperature sensor	PT100 (DIN EN 60 751)	PT100 (DIN EN 60 751)
Illumination	400 µE/m ² .s : 3x 36W colour 2023 12x 36W colour: 2084 - 600 µE/m ² .s : 3x 36W colour 2023 12x 36W colour 2084 1200 µE/m ² .s: 20x 54 W T5 colour 840 3x 36W colour 2023 -	5x 58W colour 2023 14x 58W colour 2084 4x 18W colour 840 - 20x 54W T5 colour 840 20x 24W T5 colour 840 6x 58W colour 2023
Humidifier	Ultrasonic	Ultrasonic
Humidity sensor	Plastic, hygrometric measuring device, water resistant and maintenance free.	
Requirements		
Power supply	220/240V, 16A, 50 Hz	380V, 3 fasen, 16A/fase, 50 Hz
Water connection	Advisable: demineralized water (ph value upto appr. 5 micro Siemens). Incl. ½, ¾ and hose pilaster, by means of transfer rings tailor made.	
Water drain	Condensate drain in the base.	

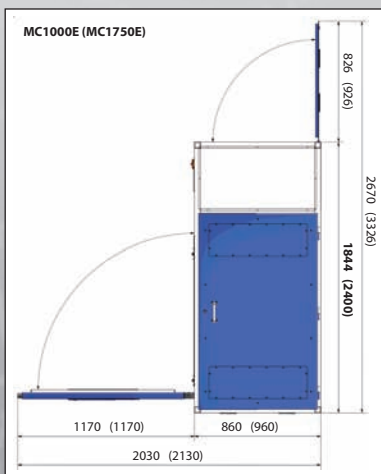


Fig. 4 Top view

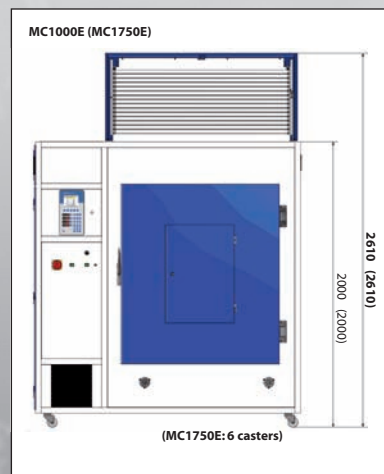


Fig. 5 Front view

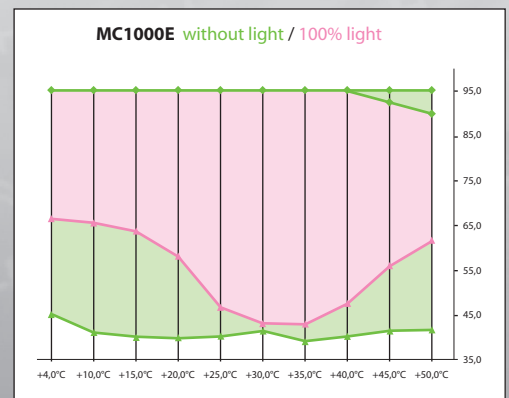
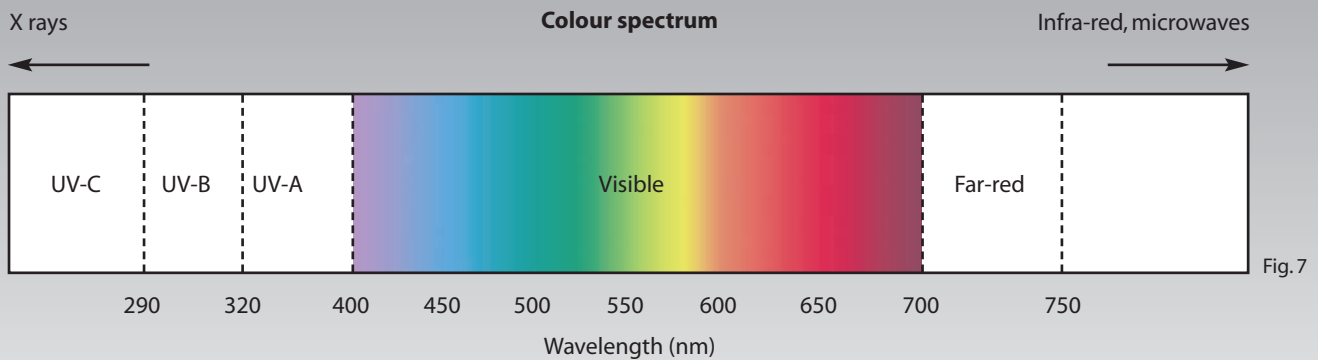


Fig. 6 Performance envelope



Illumination

- The standard Microclima (model MC1000E) is fitted with 12 daylight fluorescent tubes and 3 special red/far red fluorescent tubes (see the specifications). Standard model 1750E is fitted with 18 daylight fluorescent tubes and 5 red/far red fluorescent tubes (see the specifications).
- Fluorescent tubes for different growth applications are available on request.
- All extraneous heat sources are excluded from the working area to help optimize optimum climate conditions. That is why the fluorescent tubes and pre-switch equipment is situated in the upper compartment and separately from the working area.
- Excess heat from the lamp loft is removed directly to the external environment by separate fans.
- The lamps arrangement and chamber design creates maximum homogeneity.
- Lamp control is in ramp over time and a dawn/dusk cycle can be programmable.

Working area

The working area is executed with a platform and a lockable door. There are 2 capacity options: 1000 ltr. (MC1000E) or 1750 ltr. (MC1750E).

The platform is constructed in two sections which can be split allowing plant growth at two different heights with uninterrupted light within the same chamber. The influence of the light intensity on the plant growth and flowering can be tested by experimenting with the placement of the split platform heights.

Optional

- Stainless Steel watertank (20 litres), with side glass and low level switch for Ultrasonic humidity system. A high level switch is also available.
- Ion selective reverse osmose filter (to soften the tapwater).
- CO₂ injection and measurement.
- CO₂ reduction system (for below ambient work).
- Temperature range: -15°C up to +50°C.
- Higher light intensities, 600 $\mu\text{mol}/\text{m}^2/\text{s}$ (50.000 lux) or 1200 $\mu\text{mol}/\text{m}^2/\text{s}$ (100.000 lux) (see specifications).
- Electronic preswitch devices to reduce lamp flicker further
- Dimmable lighting (by electronic dimmable VSA's).
- LED lighting.
- Stainless Steel platforms or extra polystyrene platforms.
- A second lighting platform for extra growth capacity (m^2) for Arabidopsis.
- Ozone or nitro's oxide stainless steel pipe work for injection.

snijders scientific b.v.

www.snijders-scientific.com

Office and Production:

Laurent Janssensstraat 105
5048 AR Tilburg, The Netherlands

Showroom and Testfacilities:

Gebroeders Salastraat 40
5048 AL Tilburg, The Netherlands

Tel.: (+31) 13-4633600

Fax: (+31) 13-4638635

info@snijders-tilburg.nl

Please visit our website: www.snijders-scientific.com

There you will find all actual information, our distributors and the complete product range such as:

- More reach-in climate chambers for seed germination, insect incubation, tissue culture and photobiology tests.
- Walk-in climate rooms.
- Ultra Low Temperature freezers (-86° C) and Low Temperature freezers (-45° C).
- Cooled incubators.

* Specifications subject to changes.



Snijders Scientific B.V. meets the requirements of the Dutch foundation for the authorization of handling refrigerants during installation and maintenance of refrigeration and airconditioning equipment.



ISO-9001 certified by Lloyd's / CE approved.