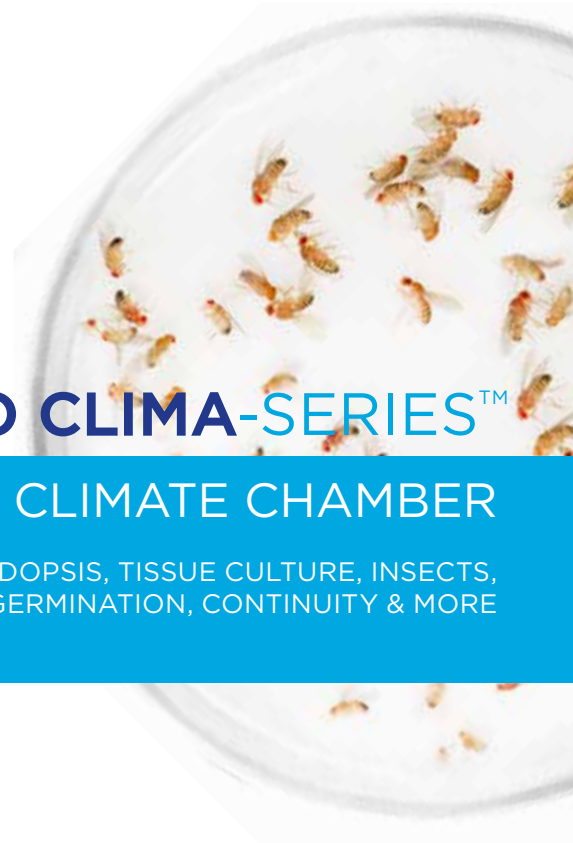




MICRO CLIMA-SERIES™

MD1400 MODULAR CLIMATE CHAMBER

FOR PLANTS, ARABIDOPSIS, TISSUE CULTURE, INSECTS,
SEED GERMINATION, CONTINUITY & MORE





MD1400 MODULAR CLIMATE CHAMBER

This flexible chamber is designed to be used for a wide range of research applications like Arabidopsis, Plant Growth, Tissue Culture, Seed Germination & Storage, Insect breeding, Continuity & many other applications within life sciences.

'Snijders Labs, experienced innovators'.

The motto, evolved during the design, development and manufacturing of this climate chamber. Our extensive experience is gained from working directly with scientists to help create design solutions for their needs. This program has helped evolve the High Specification Plant Growth Chambers. Since we control all aspects of manufacture, this allows us to react flexibly and quickly to new developments in scientific research.

The MD1400 MODULAR CLIMATE CHAMBER has been designed using the latest technology and tested extensively at customers sites. All functions like temperature, humidity, lighting and more can be controlled with the best results and are reproducible.

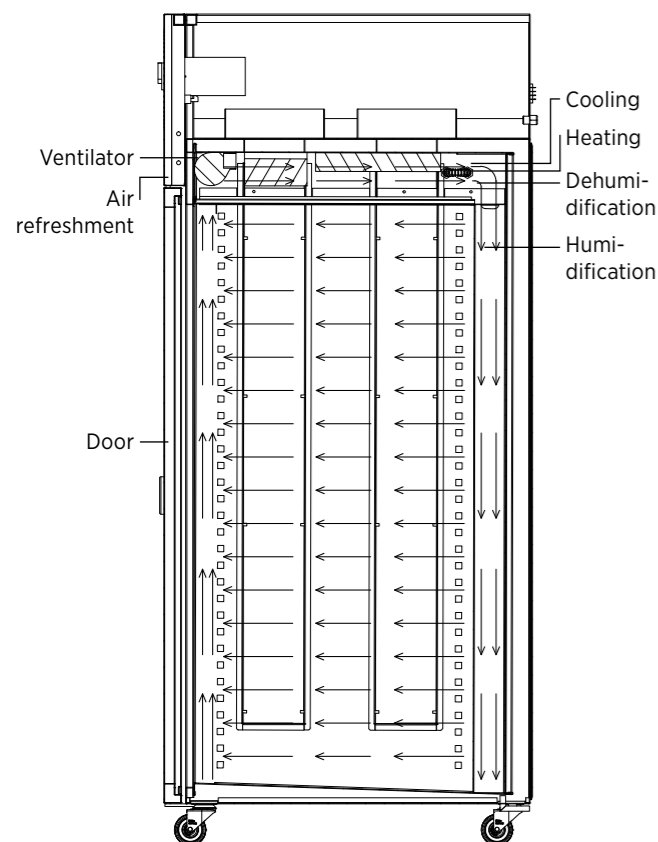
BASIC FEATURES MODULAR CLIMATE CHAMBER

- ✦ Tight temperature fluctuation across the entire internal chamber.
- ✦ Full access to the platform(s) for easy removal - no central pillar.
- ✦ All lighting platforms and stainless steel shelves beneath are in height adjustable.
- ✦ All platforms are on quick disconnect cables to ease the interchangeability of platforms.
- ✦ The real time JUMO controller can be programmed to adjust the climate and lighting in ramp or step modes.
- ✦ There are up to 100 programs and each can be programmed for a diurnal growth cycles.
- ✦ The air is heated by an electrical heating element and is humidified by a Stulz ultrasonic humidifier.
- ✦ The cooling system is designed to be highly energy efficient and is HCFC and CFC free
- ✦ The door is lockable by key.
- ✦ The chamber is mounted on 6 double 360° swivel casters, with 2 brakes at the front.
- ✦ Potential free contact for remote alarm.
- ✦ Ethernet connection for e.g. online visualization.
- ✦ The factory is ISO9000 accredited and all chambers are CE marked and RoHS compliant.

Fig. 2 No central door pillar



Fig. 1 Air circulation



CONFIGURATIONS TO SUIT SPECIFIC NEEDS

For each application this climate chamber can be configured to suit specific needs. Starting with the basic temperature control chamber and then building in the options required, such as:

- ✦ low temperature
- ✦ humidity and dehumidification
- ✦ sources of light with different spectrums and intensities
- ✦ lighting with fluorescent tubes
- ✦ lighting with LED strings
- ✦ lighting with LED production modules
- ✦ lighting with LED research modules
- ✦ dimmable lighting
- ✦ CO₂ monitoring and injection
- ✦ CO₂ scrubbing
- ✦ decontamination
- ✦ variable airflow
- ✦ cable entry port(s)
- ✦ special evaporator system for insect breeding
- ✦ software for downloading data and/or monitoring and/or programming by PC.

Custom applications available.

Fig. 3 Platform with telescopic arm (option)



CONSTRUCTION

The exterior of the chamber is galvanized plate, electronically coated with epoxy powder in off-white (RAL9002). The interior of the working chamber is made of stainless steel, coated with specially chosen white paint for maximum reflectivity and homogeneity of light. The working surface has a width of 1300mm and a depth of 630mm.

Due to our unique door design there is no temperature loss or air ingress and no need for a central door pillar (Fig.2). Hence an uninterrupted surface area, for placing large trays or boxes within the chamber.

Options

- ✦ installation of platforms with stainless steel telescopic arms (Fig. 3).

Fig. 4 mTRON T



CONTROL SYSTEM

The mTRON T is a very accurate PID controller which works in real time. The main touchscreen of the controller shows: date, time, running program, running segment, actual and set temperature/humidity, alarms and lights ON/OFF in groups. The lighting groups can be programmed separately and dimmed (option). The activity symbols for heating/cooling and additive/dehumidification show live activity.

The controller has 100 programs with each a maximum of 100 programmable steps. It allows for simple or complex diurnal or step programs. One complete program can be repeated a set number of days to infinity.

By connecting the MD1400 to intranet/internet the display can be visualized on the PC and / or display of an Android mobile phone.

ALARM SYSTEM AND SAFETY

An acoustic and visual alarm is activated when an alarm situation occurs, for example when the actual temperature deviates by 5°C or the humidity by 5% higher or lower than the set point. The alarm spans are adjustable.

The chamber is also executed with an absolute high and low temperature safety. The lights and heating will be switched off by the maximum safety thermostat. The cooling and dehumidification will be switched off by the minimum safety thermostat.

A potential voltage free contact is standard and located at the rear of unit. As soon as an alarm activates, this contact will become active and will give a signal to a BMS system, when connected.

An alarm can also be send via email when the MD1400 is connected to the intranet/internet by the standard Ethernet connection. Alarming by testing is optional.

COOLING AND HEATING

The cooling system with 100% CFC and HCFC free refrigerants. The Danfoss Optyma compressor and condenser are silent with energy saving systems for a long life expectancy. The refrigeration works in a bypass system when there is no cooling and dehumidification requirement.

This design contributes greatly to the energy saving achieved and to the longevity of the compressor.

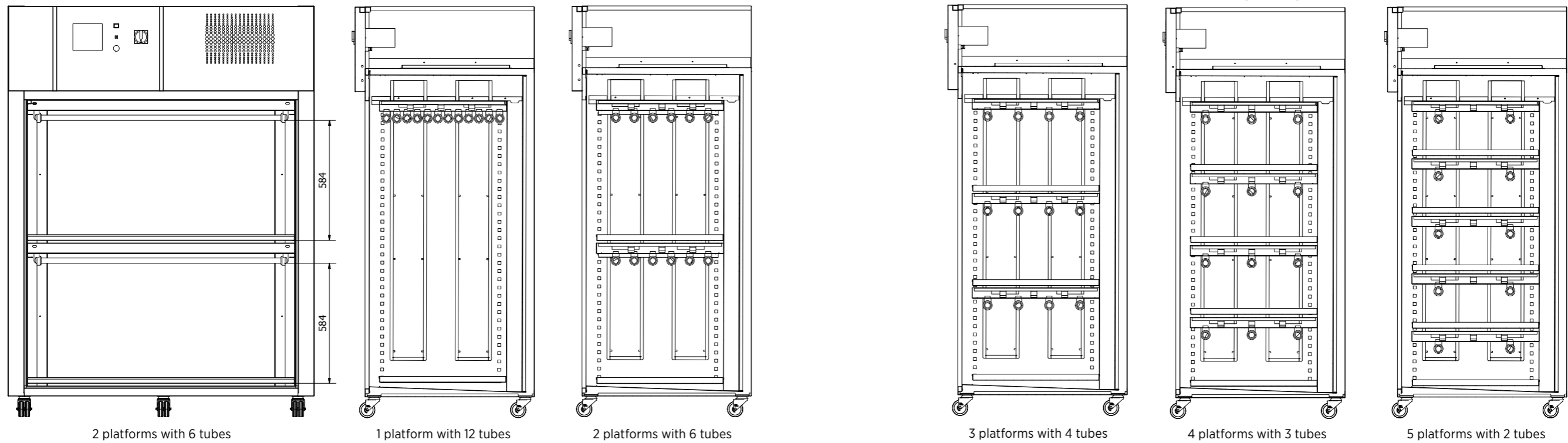
All components are easy accessible for maintenance.

Front view



Top view





ILLUMINATION AND SHELVES

This MD1400 can be setup with multiple light platforms with the same or differing light sources and intensities. The lighting arrangement is designed to ensure homogeneity of light over each growing shelf. All fluorescent tubes and/or LED research modules can be dimmable from approx. 20% up to 100%.

They are programmable via the JUMO controller or manually adjustable.

The in height adjustable stainless steel shelving and lighting platforms make it possible to have different growing heights.

QUANTITY PLATFORMS	LIGHTING CONFIGURATION EACH SHELF	MAXIMUM INTENSITY AT 15CM FROM THE TUBES	GROWING HEIGHT
1	12 x 36W fluorescent tubes	770 $\mu\text{mol m}^{-2} \text{s}^{-1}$	1270 mm
2	6 x 36W fluorescent tubes	410 $\mu\text{mol m}^{-2} \text{s}^{-1}$	584 mm
3	4 x 36W fluorescent tubes	250 $\mu\text{mol m}^{-2} \text{s}^{-1}$	350 mm
4	3 x 36W fluorescent tubes	190 $\mu\text{mol m}^{-2} \text{s}^{-1}$	235 mm
5	2 x 36W fluorescent tubes	140 $\mu\text{mol m}^{-2} \text{s}^{-1}$	166 mm



HUMIDIFICATION AND DEHUMIDIFICATION

The MD1400 has an inlet at the rear for direct connection to the water supply. Snijders Labs advises to use demineralized water (>6,5pH) or if not available water from a Reverse Osmosis system. Tap water with a hardness of more than 4°D will affect the lifetime of the humidifier. If there is no direct water supply an optional separate water tank, feeding the humidifier by

a gravity feed, can be installed. The air inside the working area is humidified by means of an ultrasonic humidifier and dehumidification is carried out by the evaporators.

Condensate water is removed from the working area by stainless steel tubes to the drain at the base of the chamber.



Water inlet for the Ultrasonic humidifier.



Reverse Osmosis water filter.



MODULAR CLIMATE CHAMBER

TECHNICAL INFORMATION

PHYSICAL		MD1400
Total volume		1337 liters
External dimensions (w x d x h)		1500 x 910 x 2000 mm
Internal dimension (w x d x h)		1300 x 740 x 1390 mm
Surface each platform		1300 x 630 = 0,82m ²
Airflow		horizontal (or vertical, optional)
Airspeed		0,25 m/s
SPECIFICATIONS		
Temperature range (lights off)		+4°C / +50°C (FT); +4°C / +40°C (LED)
Temperature range (lights on)		+8°C / +50°C (FT); +8°C / +40°C (LED)
Temperature fluctuation (on 1 spot)*		lights on: ± 1,0°C; lights off: ± 0,3°C
Temperature variation*		lights on: ± 2,5°C; lights off: ± 1,0°C
Humidity range (optional)*		40-95%
Humidity fluctuation (on 1 spot)*		lights on: ± 7%; lights off: ± 3%
Humidity variation*		lights on: ± 8%; lights off: ± 4%
Illumination possibilities (optional) (also in combination)		Fluorescence tubes (FT) &/or LED LED strings , productions LEDs or research LED modules
FACILITIES		
Controller (incl. humidity and / or light)		Jumo mTRON T, electronic PID, touchscreen
Sensor (only temperature)		PT100 Ω
Sensor (temperature incl. light)		PT100 Ω
Sensor (temperature incl. humidity)		capacitive
Humidifier (optional)		Stulz, Ultrasonic
CO ₂ control and measurement (optional)		200ppm to 10.000ppm
GENERAL		
Maximum power consumption (all lights ON & heating ON)		220-240V; 50 Hz P max = 1,23 kW/h, I max = 8 - 11,5A, P = 1.300 W
Noise level		49 dB
Weight basic unit		400 kgs

*depending temperature and light settings

Specifications subject to change

SNIJDERS LABS: EXPERIENCED INNOVATORS

SNIJDERS LABS forms part of the Snijders Group, which actively delivers equipment and products for scientific research & development as well as internal transport systems and examination couches for the health care sector under SNIJDERS CARE. All design, manufacture and testing is held in house to assure high quality production and investment in new technologies for the production of all Snijders products. The total control of the manufacturing line means that Snijders can offer total quality, in-depth knowledge and detailed assistance to all of their clients.

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SERVICE AND WARRANTY

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WWW.SNIJDERSLABS.COM

There you'll find all the latest information about:

- + ULT freezers (-86°C) with datasheets of any type, racking systems, boxes and other accessories
- + a variety of climate cabinets for plants, seed germination, fungi, snails and insects research with temperature-, light- and humidity control
- + (cooled) incubators and incubator walls, designed for general research in, for example microbiological, food, water and medical research laboratories.



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