



MMM Group

LABORATORY DRYING OVENS AND INCUBATORS

with innovated control automatics ECO line and EVO line

NEW
CONTROL
AUTOMATICS



ECOCELL® DUROCELL VENTICELL® STERICELL® VACUCELL® INCUCELL®
INCUCELL® V FRIOCELL® CLIMACELL® CO2CELL

Innovative heating technology in new lines



protecting human health

Tradition, Quality, Innovation

As one of the world's leading suppliers of sterile processing systems, MMM has been working actively to promote good health since 1954. With a full range of sterilization and disinfection products and services – that can be found in every branch of healthcare from hospitals and scientific institutes, to laboratories and the pharmaceutical industry – MMM, has over the years, consolidated its position as a pioneer of quality and innovation both in the German and international market.

In our two production facilities based in Stadlern, Germany, and Brno, in the Czech Republic, we manufacture products that meet the highest demands of our customers world wide. The depth and precision of production standards at both plants ensure that we accomplish the rigorous quality requirements of medical engineering.

900 competent employees work together as a committed and enthusiastic team, dedicated to achieving the mission of the MMM Group.

Applications



Pharmaceutical Industry

Stability testing and photo stability testing according to ICH 279/95 Option 2, long term storage.



Cosmetic Industry

Durability testing, testing of cosmetic products or primary materials stability.



Construction Industry

Long-term testing of quality and ageing of materials in construction industry – cement, paints, asphalt, construction plastics, glues, etc.



General and Applied Industry

E.g. cultivation of tissue cultures – human or animal ones.



Food and Beverage Industry

Testing of food quality under simulated transport or storage conditions – export of fruits, etc.



Packaging Material Industry

Long-term testing of packing technologies.



Electronic Industry

Durability testing of electronic boards and printed circuits.



Automotive Industry

Testing of materials ageing – tyres, sealing, etc.



Zoology

Simulation of conditions for sea organisms research – seaweed or cultivation of insect eggs.



Botany

Studies of germination, green plants growing for further research.



Field of Metrology and Quality Control in Industry

Checking and calibration of industrial measuring gauges.



Chemical – Industrial

Fertilizers, pesticides, detergents, paint, oil, etc.

General and Actively Provable Quality

Technical acceptance of a device pursuant to client's requirements is obvious – on request even in client's presence or on device installation site (SAT – Site Acceptance Test). After the output control, 27-point measuring according to DIN 12880 and 3-point measuring of Rh may be performed on some devices. Documentation may be supplied to heating technology users to prove permanent quality of processes in compliance with the device parameters as declared by the device manufacturer (importer).

IQ – Installation qualification

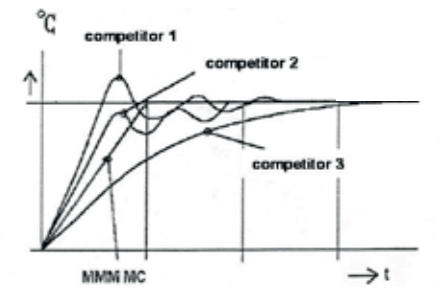
OQ – Operation qualification

PQ – Function qualification (Validation).

Tests and validation according to standards are performed using the potential of our accredited testing laboratory.

Fuzzy Logic Regulation

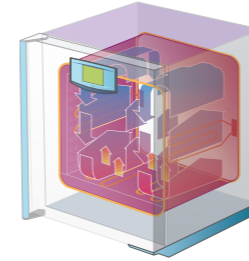
Advanced Fuzzy logic technology – unlike classic mechanic or electronic control (PID) – makes assessment of data from a running process, like chamber volume, operation temperature, humidity or other regulated items after the program start, using specially developed software and simultaneously it makes an assessment of chamber filling with samples. Based on the information, it continuously adjusts the input values of regulation (intensity of heating, cooling, etc.) and optimises the process of regulation with the aim of minimising the time for reaching the process parameters without individual items overshoots. In this way it is possible to reach pre-set operation levels of items in shortest possible time, without useless power consumption and to make the work with the device maximally efficient. Simultaneously, the Fuzzy logic reduces restoration times after the device door opening in the course of the operation cycle.



6 Physical Ways of Heat Transfer

Natural Circulation

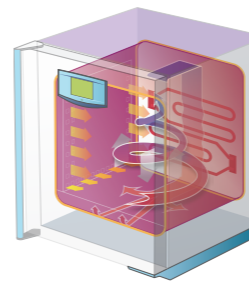
ECOCELL®, DUROCELL®, INCUCELL®



The principle of operation is based on fine gravitation air flow in electrically heated chamber of the device. The double-tube construction of the chamber together with control automatics arrange homogenous distribution of temperature in the chamber, exact progress of processes and short recovery times (return to selected temperature) after the door opening. It is characterised by its economic operation. It is suitable for simple process of drying and heating of standard materials. The devices work on no-noise basis.

Forced Circulation

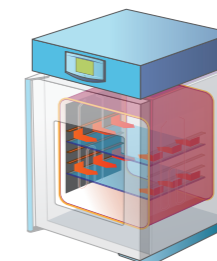
VENTICELL®, STERICELL®, INCUCELL® V



The principle of operation is based on fine patent-protected air flow using a ventilator in electrically heated chamber of the device. The used patent thermo-dynamic system arranges development of a homogenous air flow rising in a spiral inside of the operation chamber. By natural tempering from the bottom upstairs, the process simulates natural processes and it arranges optimal heating of materials and high space precision of temperature in the chamber with minimal power consumption. The use of the system of air distribution in rear and side walls arranges homogenous mixture of warm air and consequently exact temperature profile.

Circulation in Vacuum

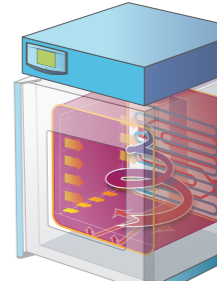
VACUCELL®



The principle of operation is based on the principle of drying in vacuum with the possibility of air displacement in the chamber by an inert gas. The direct heated stainless steel chamber of the device allows precise heating and drying of samples up to constant weight. Standard equipment includes a bushing with a diameter of 40 mm, input for inert gas connection and a needle valve for fine dosing. For the case of inner overpressure, the device is equipped with a large-area door overpressure valve "Ventiflex".

Circulation with Cooling

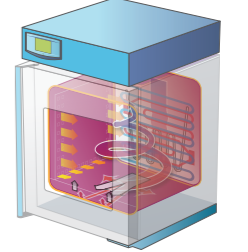
FRIOCELL®



The principle of operation is based on fine forced circulation of air in connection with patent-protected powerful cooling located in the chamber. The unique cooling system together with multi-processor control automatics offers exact and economical simulation of selected natural processes and it reduces samples evaporation.

Circulation with Cooling and Controlled Humidity

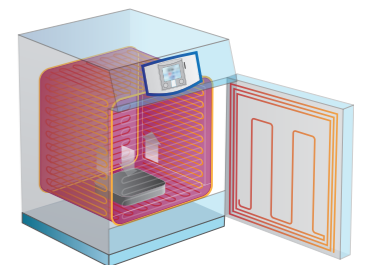
CLIMACELL®



The principle of operation is based on fine forced circulation of air in connection with patent-protected powerful cooling and humidifier located in the chamber. The multi-processor control system of active humidification and dehumidification with powerful lighting system guarantees excellent homogenous conditions for exact simulation of selected climatic actions.

Circulation with CO₂ Atmosphere

CO2CELL



The principle of operation is based on fine gravitation flow of operation gas in direct heated chamber at high relative humidity and selected gas concentration. The unique system of chamber and door eliminates the necessity of a ventilator and so it eliminates even related risks of mutual contamination of samples due to vibrations and forced circulation of operation atmosphere. Possible work in CO₂, respectively O₂ and N₂ atmosphere.



Eco line

- Intuitive control
- Microprocessor process control Fuzzy logic
- Multi-lingual communication
- Acoustic and visual alarm
- LED indicator of device functionality
- LCD display – 3 inches (7,6 cm)
- Transflective brilliant FSTN display, using COG technology (it is backlit and it uses external lighting reflection – higher intensity of external light increases the display readability)
- Adjustable display contrast depending on device placement
- Exceptionally wide vision angle
- Large signs on the display visible from afar
- Current values (eg. temperature, humidity for Climacell®, pressure for VacuCell®) during the device operation are enlarged for easy readability
- Resistant foil keyboard with SoftTouch surface (pleasant to touch)
- Mechanic response of keys
- Lit symbols integrated directly in the foil keyboard
- Keyboard lock to block unauthorised access – adjustable by multiple pressing
- Real time programming and cycling (ramps as optional equipment)
- Up to 9 programs, 2 segments for each program and up to 99 cycles.
- USB Host port for flash disc connection for easy export of the relevant data (optional equipment)

Evo line

- Intuitive control
- Microprocessor process control Fuzzy logic
- Multi-lingual communication
- Acoustic and visual alarm
- LED indicator of device functionality
- Touch screen – 5,7 inches (14,5 cm)
- Graphic displaying of a new program
- Control through colour icons
- Touch display lock – protection from unauthorised access by a password
- Multi-level administration of users (corresponding to FDA 21 Part 11)
- Data coding and no-manipulability (according to FDA 21 Part 11)
- Up to 100 programs and up to 100 segments for each program
- Programming of temperature ramps, real time and cycling
- Annual data recording in graphic and numeric form
- Data export in online and offline mode
- Pre-set service programs for prompt diagnostics of failures
- Easy service diagnostics including remote access
- SD memory card, USB Host and interface RS 232 – included as a standard
- Connection: WiFi, USB Device or Ethernet interface with proper IP address for remote data transfer, control and diagnostics (optional equipment)

Connectivity

- RS 232
- USB Device
- SD card
- WiFi (optional equipment)
- USB Host (optional equipment)
- Ethernet / Internet (optional equipment)
- BMS remote alarm (optional equipment)

Data Output

Thanks to use of up-to-date electronic components, the EVO line and ECO line devices are not limited in any way in data peripherals connection. The basic configuration contains traditional and reliable interface RS 232, USB Device. The device may be easily completed with another interface – see the table. WiFi with reach range up to 100 meters, USB Host for data export and import and the Ethernet (RJ 45) interface for network connection. It is also possible to configure remote connection and to work only with data in remote mode (Internet).

ECO line		EVO line	
Type	Use for	Type	Use for
RS 232	PRINT, Printer Archive, WarmComm 4	RS 232	PRINT, Printer Archive, WarmComm 4
USB device	Warmcomm 4	USB device	WarmComm 4
		SD karta	Export, Import*

Optional equipment			
Communication set ECO		Communication set EVO (IPv4)	
Ethernet – RJ 45	WarmComm 4 (remote diagnostics)	WiFi - 802.11b/g	WarmComm 4 (remote diagnostics), web server, e-mail, android appl.- CLC EVO monitor.
USB host	Export, Import ** Flashdisk	USB host	Export, Import*
		Ethernet – RJ 45	WarmComm 4 (remote diagnostics), web server, e-mail, android appl.- CLC EVO monitor.
Communication set SD CARD			
SD CARD***	Export Import **		

* Export – recording of data, programs, user interface (users administration), communication settings, audit trail
 Import – of programs, user interface (users administration), communication settings
 ** Export – recording of data, programs, (datalogger – via flash disk)
 Import – of programs
 *** Note: In case of combination of a SD card + USB-host – flash disk there is active only one – it is not possible to copy and mutually record the data



WarmComm 4.0

Universal Data Administration for the MMM Group Devices



- Connectible to all and any MMM Group devices
- Stable platform of the SQL library
- User-friendly environment
- Connection via Ethernet to 25 devices, via RS 232, USB – limited by the number of ports on PC
- Two-way communication – data monitoring and device control
- Compatibility with former lines of heating technology devices
- Client-Server architecture
- Service module for local and remote diagnostics
- Three levels of the program depending on client's requirements (B-P-F)
- In compliance with FDA CFR 21 Part 11 (version F)
- Web support, on-line updating
- Protected licence policy
- Unpretending HW requirements, compatible with MS Windows
- Validation documentation IQ/OQ



Set Up the Drying Oven or Incubator Based on Your Needs

Approval acc. to 2014/35/EU, 2014/30/EU, ICH 279/95 Option 2, FDA 21 Part 11.
The STERICELL® product line complies also with requirements of Medical Device Directive 93/42/EEC.



Natural / Forced
Air Convection

Cooling Incubators

Climatic Chambers

CO₂ – Atmosphere

Natural Air Convection

Forced Air Convection

Vacuum

ECOCELL®

The line of economic driers with wide temperature range, exact and reliable course of simple drying processes and materials heating. The ECOCELL® line produces no noise and provides a very soft air convection within the chamber.

Technical data

Volume: 22, 55, 111, 222, 404, 707 litres
Working temperature: 5°C above ambient temperature up to 250/300°C
Interior: stainless steel, mat. No. 1.4301 (AISI 304)
Clean premises version – on request

DUROCELL

Special purpose drying ovens DUROCELL with highly resistant EPOLON coating, protecting the internal chamber aggressive substances like acids or alkaline liquids. This device ensures an optimal goods temperature equalisation. It is ideal for acid and basic hydrolysis, extraction of non-inflammable materials and decomposition of substances in solid phase.

Volume: 22, 55, 111, 222 litres
Working temperature: 5°C above ambient temperature up to 125°C
Interior: stainless steel, mat. No. 1.4301 (AISI 304)
covered with chemically resistant layer
Clean premises version – on request

VENTICELL®

Due to a patented ventilation system the air within the VENTICELL® chamber is ventilated in a regular spiral way. This leads to a homogenous temperature profile throughout the chamber and short heating times. Operating economy is ensured by higher rate and precision of heating in laboratories. Especially suitable for very moist goods.

Volume: 22, 55, 111, 222, 404, 707 litres
(pass-through version except for the 22 l volume)
Working temperature: 10°C above ambient temperature up to 250/300°C
Interior: stainless steel, mat. No. 1.4301 (AISI 304)
Clean premises version – on request

STERICELL®



STERICELL® is intended for hot air sterilization of materials under the specified temperature and duration. It is characterized by quiet running with a patented fine system of forced air circulation in the chamber by means of a built-in fan which eliminates the "cold air" area formation. Loose and deposit-forming substances can be sterilized in closed bottles. The device is suitable for medical and veterinary clinics, hospitals, pharmacies, health care centres, and laboratories.

Volume: 22, 55, 111, 222, 404 litres
(pass-through version except for the 22 l volume)
Working temperature: 10°C above ambient temperature up to 250°C
Interior: stainless steel, mat. No. 1.4301 (AISI 304)
Clean premises version – on request



VACUCELL®

Temperature sensitive, easy decomposable or oxidative materials can be dried very tenderly in VACUCELL® vacuum drying ovens, where there is the opportunity of extrusion of air by inert gas. Also complicated components with hardly accessible hollow spaces are drying quickly and effectively in VACUCELL® ovens. Ideal for drying of samples to constant weight. Special application of the device is possible mainly in the fields of plastics processing, pharmaceutical, chemical, electro technical and other industries.

Volume: 22, 55, 111 litres
Working temperature: 5°C above ambient temperature up to 200/300°C
Door window
Integrated duct for sensors etc. (∅ 40 mm)
Inert gas connection
Needle valve for fine dosing
Pressure resistant inner chamber
Safety valve-door VENTIFLEX
Interior: stainless steel, mat. No. 1.4571 (AISI 316Ti)

INCUCELL® / INCUCELL® V

Suitable for safe treatment of microbiological cultures. The INCUCELL® line produces no noise and provides a very soft air convection within the chamber, the variant INCUCELL® V (with a fan) has an advantage of more precise temperature distribution with small deviations. These devices can be used especially in biological and microbiological laboratories, quality tests in pharmacy, cosmetics and testing in veterinary medicine and food processing industry.

Technical data

Volume: 22, 55, 111, 222, 404, 707 litres
Working temperature:
INCUCELL®: 5°C above ambient temperature up to 100°C
INCUCELL® V: 10°C above ambient temperature up to 100°C
Inner glass door
Interior: stainless steel, mat. No. 1.4301 (AISI 304)

FRIOCELL®

The high technical standard of our FRIOCELL® incubators allows exact incubation processes both for variation and deviation. The units have very short recovery times and show an excellent results in keeping the precise regulation. A unique cooling system ensures, that the samples are not dried while cooling. A high performance system of lighting ensures outstanding homogenous parameters for tests and growth conditions. These devices are designed for use in biotechnology, botany, food processing industry, cosmetics, chemical industry etc.

Volume: 22, 55, 111, 222, 404, 707, 1,212 litres
Working temperature: 0.0°C up to 100°C
range up to 70°C for the volume of 1,212 l
FC EVO as optional equipment up to -20°C
FC EVO as optional equipment of chamber decontamination up to 160°C (except for the 1,212 litres volume)
Refrigerant: R 134a without CFC (excluded volumen 22)
Peltier effect – FC 22
CO₂ concentration: 0,2% up to 20%
Inner glass door
Interior: stainless steel, mat. No. 1.4301 (AISI 304)

CLIMACELL®

The CLIMACELL® series was specially developed for applications, in which as far as possible exact and reproducible simulation of various environmental conditions is important, e.g. stability testing of components, packaging materials, food or chemicals, drugs, germination studies, plant cell or tissue cultures, insect cultures. This devices offers an interesting alternative to expensive testing chambers and testing rooms. Microprocessor controlled humidity assembly with powerful lighting system are warranty of the excellent homogene parameters for tests and growth conditions.

Volume: 111, 222, 404, 707, 1,212 litres
Working temperature: without humidity 0.0°C up to 100°C,
with humidity: 10°C up to 95°C
range up to 70°C for the volume of 1,212 l
CLC EVO as optional equipment up to -20°C
CLC EVO as optional equipment of chamber decontamination up to 160°C (except for the 1,212 litres volume)
Refrigerant: R 134a
Cooling medium for generating the humidity: distilled water
Controlled humidity: 10% - 98% RH
Microprocessor controlled humidifying / dehumidifying system
CO₂ concentration: 0,2% up to 20%
Inner glass door
Interior: stainless steel, mat. No. 1.4301 (AISI 304)

CO2CELL

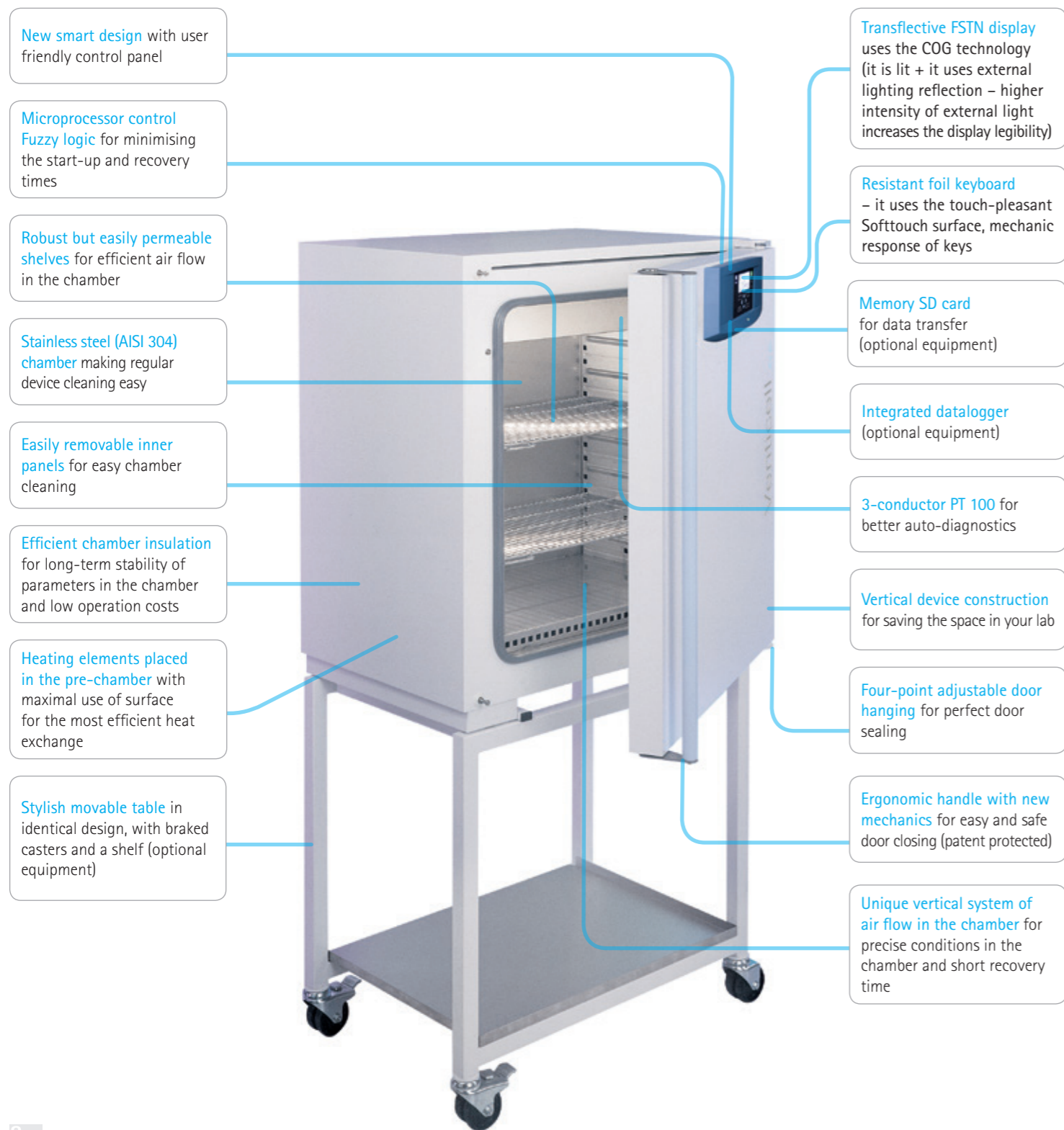
Latest generation of CO₂ incubators is focused on constant and reproducible conditions for cell growth procedures, tissue and other cultivating cultures. Trial circuit heating system eliminates the need of fan and consequently lowers the risk of vibrations and cross-contamination. Drift-free infrared sensor provides maximum reliability and measurement precision during the whole process. Thanks to the direct heated chamber, installation and maintenance is very easy. Inner glass door is sealed towards the chamber insulation which allows you to check the samples without losing the internal conditions. Outer glass door is sealed towards external sealing. Range of useful options supports features like sterilization on 200°C while CO₂ sensor remains inside machine, split inner glass door lowers the recovery time after door opening, Oxygen control, etc.



CO2cell 50 Standard

VENTICELL® ECO line

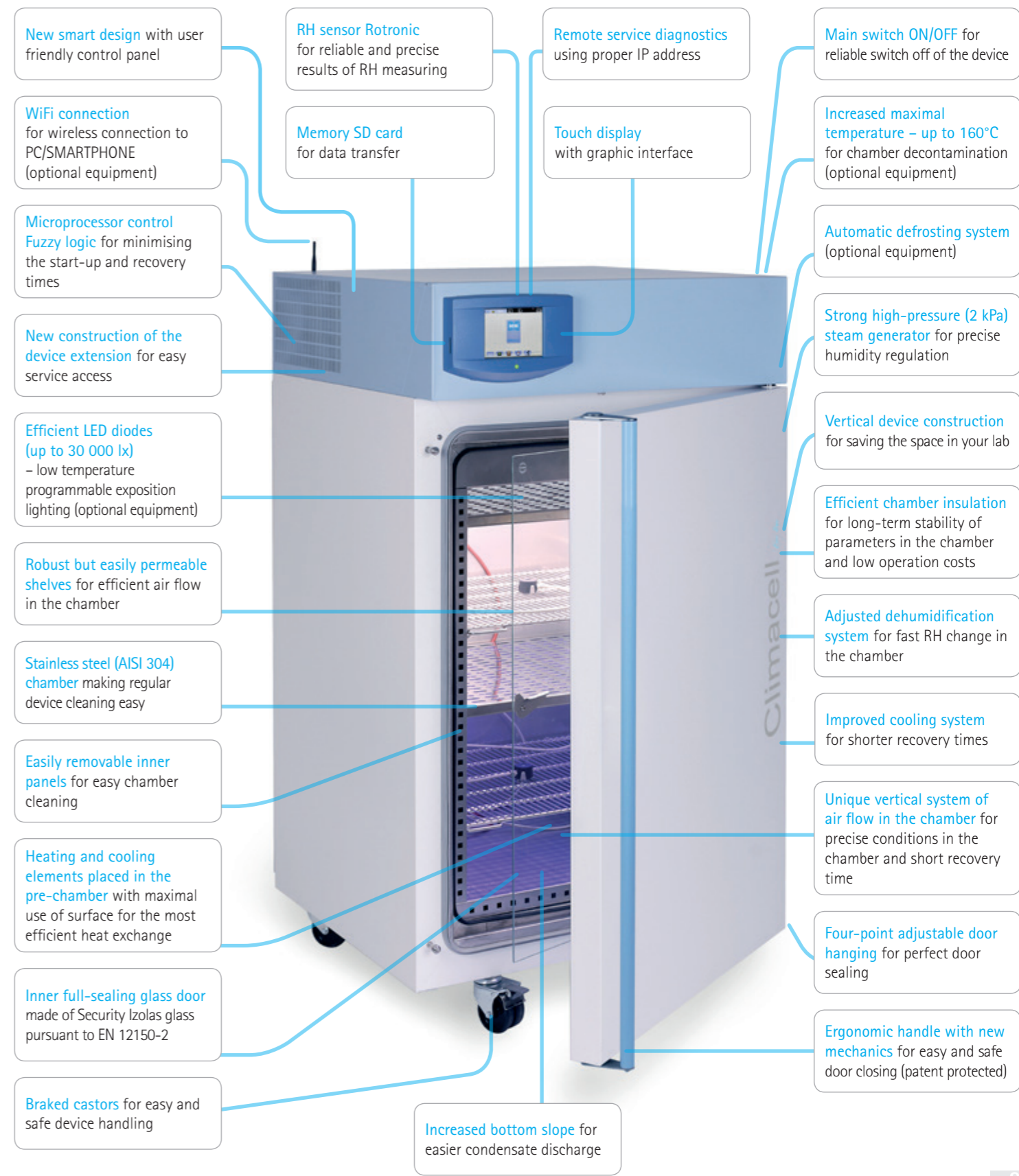
- The best price / performance ratio
- High speed or air exchange during samples drying
- Patented, vertical air flow with pre-heating chamber and asymmetrically perforated panels providing well-proved vertical spiral air flow with the best spatial homogeneity
- Patented, practical, large and well-proved door handle, main door openable to 220°
- Fast start-up and recovery times thanks to powerful heating elements and regulation Fuzzy logic



CLIMACELL® EVO line



- Precise device for the most demanding simulation processes
- Patented vertical air flow with pre-heated chamber and symmetrically perforated panels provide well-proved vertical spiral air flow with the best space homogeneity
- Patented practical large and well-proved door handle, robust braked castors and main door openable to 220° (except for the volume 1,212 l)
- High-pressure steam generator in new and easily accessible position and freezing element in new design



Pass-through Version

This version is available with VENTICELL® 55 up to 707 litres and STERICELL® 55 up to 404 litres. It allows for the material to be inserted from the loading side and to be taken out – after sterilization – on the unloading side (clean premises).

This solution can be used in case of the device to be built in in pharmaceutical partition walls separating premises with different cleanliness class.

Control panels on both sides of the device inform about the process in progress and about the device status. Door micro switches provide supervision over the batch in the chamber. Depending on the device type, the devices may provide additional drying of the material before sterilization.

Optional Equipment Allows the Device Adjustment so as to Meet Various Specifications:

- Mechanic door lock
- Electro-magnetic door lock
- Flexible temperature sensor PT 100
- Transport and loading system with carriages made of stainless steel AISI 304
- Exterior of stainless steel AISI 304
- Inner chamber of stainless steel AISI 316 (standard material being AISI 304)
- BIOSEAL partition walls for separation of premises with different cleanliness classes
- Independent control panel placed on the wall next to the device
- Overpressure version of the device with an additional fan
- HEPA filters for incoming air H13 or H14
- Extension chimneys for outgoing air for connection to client's air system
- WarmComm software



Programmable exposition lighting

New generation of the FRIOCELL® and CLIMACELL® eco and evo line devices offers wide range of possible use of selected lighting. Variability of placement, selection of light sources, user-friendliness and possibility of fluent control of intensity meet even the highest demands towards applications with exposition lighting.

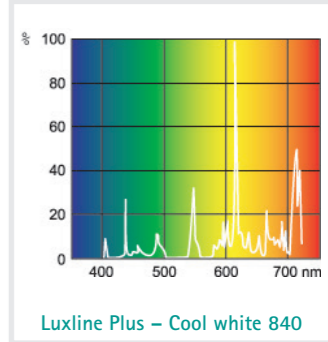
Fluorescent Tubes in Doors

Traditional placement of the light cassette with reworked design and increased lighting intensity (up to 36,000 LUX). Balanced lighting of the whole chamber section with minimal purchase costs and minimal influence on conditions in the chamber.

It can be completed with intensity measuring. Suitable for industrial simulation of materials ageing or non-demanding processes of growth simulations. Simulation of day and night conditions.

Extended options for FRIOCELL® evo line and CLIMACELL® evo line:

- Fluent intensity regulation 0-100% in 1% steps.
- Possibility of setting the duration of the light exposition through controlled lighting intensity.



Fluorescent Tubes in Shelves

A vertical source of up to four light cassettes with direct lighting and variable height of the exposure. Balanced exposure of the whole shelf and optimal use of the chamber volume for the area surface lighting. Efficient balancing of temperature emissions thanks to perforation of cassettes and precise regulation of conditions in the chamber and under full day lighting. Maximal intensity 20,000 LUX (12 cm below the source). It can be completed with intensity measuring. Typical for tests of photo stability or basic growth simulations in botany. Simulation of day and night conditions. Different colours of the light source.

Extended options for FRIOCELL® evo line and CLIMACELL® evo line:

- Fluent intensity regulation 0-100% in 1% steps.
- Possibility of setting the duration of the light exposition through controlled lighting intensity.



LED Lighting in Doors

Economic solution of the white LED lighting with higher intensity (up to 21,000 LUX). Balanced exposition of the whole section of the chamber with low temperature emissions. Suitable for industrial tests with higher requirements towards intensity. Simulation of day and night conditions. It can be completed with the intensity test.

Extended options for FRIOCELL® evo line and CLIMACELL® evo line:

- Fluent intensity regulation 0-100% in 1% steps.
- Possibility of setting the duration of the light exposition through controlled lighting intensity.

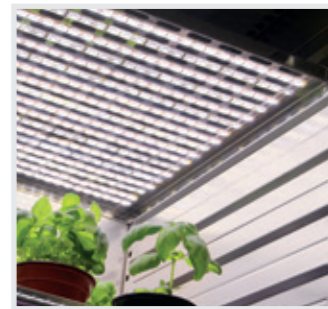


LED Lighting in Shelves

Precise vertical exposure with white LED lighting with maximal intensity (up to 30,000 LUX), low temperature emissions of the light source, variability of lighted cassettes placement. The LED offers high standard of light conditions simulation for industrial use or for use in botany. Maximal use of lighted surface of shelves compared to the chamber volume. Simulation of day and night conditions. It can be completed with the intensity test.

Extended options for FRIOCELL® evo line and CLIMACELL® evo line:

- Fluent intensity regulation 0-100% in 1% steps.
- Possibility of setting the duration of the light exposition through controlled lighting intensity.



LED Colour Spectrum

A special LED colour source emitting vertical rays combining high intensity of lighting with optimal colour spectrum of LED source for photo synthesis and low power consumption. Light sources DeepRed, FarRed, Blue with individual setting of intensity establish ideal conditions for growth of green plants and they will allow acceleration of different grow phases of the plant's life. It can be completed with lighting intensity measuring ($\mu\text{mol}/\text{m}^2/\text{s}-1$).

- Fluent regulation of individual sources 0-100% in 1% steps
- Available only for FRIOCELL® evo line and CLIMACELL® evo line.



Drying ovens equipment	IND	EC ECO	DC ECO	VC ECO	SC ECO	VU ECO	VU EVO
Fan revolutions 10-100%		-	-	•	-	-	-
Acoustic alarm		•	•	•	•	•	•
Visual alarm		•	•	•	•	•	•
Protective thermostat type		Typ 2	Typ 2	Typ 2	Typ 2	Typ 2	Typ 2
Users access administration/ keyboard blocking		•	•	•	-	•	-
Users access administration/ password-adjustable		-	-	-	-	-	•
Main switch		-	-	-	-	•	•
Chrome-plated tray		2+o	-	2+o	-	-	-
Stainless steel tray		o	2+o	o	2+o	-	-
Stainless steel perforated shelf/ non-perforated in case of Vu		o ¹⁾	o ¹⁾	o ¹⁾	o	o	o
Chamber without tray holders and trays		o	o	o	o	-	-
Aluminium shelf		-	-	-	-	2+o	2+o
Test tubes holder (Loewenstein)		o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Shelf for test tubes ø 16 mm		o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Shelf for test tubes ø 22 mm		o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Drip tray		o	o	o	o	-	-
Suspension system for samples below the chamber ceiling		o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Left door	01	o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Door lock (the same key for the order)		o	o	o	o	o	o
Door lock (various keys for the order)		o	o	o	o	o	o
Automatic door lock	02	o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	o	o
Automatic door lock (for passing modification)		-	-	o ¹⁾	o ¹⁾	-	-
Stainless steel shell modification		o	o	o	o	o	o
Stainless steel interior mat. No 1.4301/304		•	•	•	•	o ¹⁰⁾	o ¹⁰⁾
Stainless steel interior mat. No 1.4404/316L		o	o	o	o	o ¹⁰⁾	o ¹⁰⁾
Flexible PT sensor (max. number)	03	o 1	o 1	o 1	o 1	o 1	o 4
Flexible PT sensor via the doors (max. number)	03+	Δ 1	Δ 1	o 1	o 1	-	-
Flexible PT sensor at the temperature of 300°C	03+15	o	-	o	o	Δ	Δ
Port ø 25 mm R (centre/centre)		o	o	o	o	-	-
Port ø 25 mm L (centre/centre)		o	o	o	o	-	-
Port ø 50 mm R (centre/centre)		o	o	o	o	top 40	top 40
Port ø 50 mm L (centre/centre)		o	o	o	o	-	-
Port ø 100 mm R (centre/centre)		o ¹⁾	o ¹⁾	o ¹⁾	-	-	-
Port ø 100 mm L (centre/centre)		o ¹⁾	o ¹⁾	o ¹⁾	-	-	-
Port - special shape or position		Δ	Δ	Δ	-	Δ	Δ
Window and light (max. up to 250°C)	04	Δ ¹⁾	-	Δ ¹⁾	-	• ⁹⁾	• ⁹⁾
Interior lighting (without window)		o ¹⁾	-	o ¹⁾	-	-	o
Passage modification (including covering sheets on unloading site)	05	-	-	o ^{1,7)}	o ¹⁾	-	-
Covering sheets for the unloading site		-	-	o ^{1,7)}	o ¹⁾	-	-
Special modification of cases for insulator technologies		Δ	Δ	Δ	Δ	Δ	Δ
Loading system		o ^{1,2,3,4)}	-	o ^{1,2,3,4)}	o ^{1,2,3,4)}	-	-
H13 HEPA filter 99,95%	06	-	-	o	o	-	-
Overpressure in chamber incl. HEPA H13	07	-	-	o	o	-	-
H14 HEPA filter 99,995%	06+	-	-	o	o	-	-
Overpressure in chamber incl. HEPA H14 99,995%	07+	-	-	o	o	-	-
Measuring of overpressure in the chamber		Δ	-	Δ	Δ	-	-
Modification without particles		Δ	Δ	o	o	Δ	Δ
Chimney prolongation - direct		o	o	o	o	-	-
Chimney prolongation 90°		o	o	o	o	-	-
Chimney prolongation - direct (with condensate removal)		o	o	o	o	-	-
Chimney prolongation 90° (with condensate removal)		o	o	o	o	-	-
Manual flap		•	•	•	•	-	-
Automatic flap		-	-	-	-	-	-
Modification of device without with castors to adjustable feet		o ^{1,2,3,4)}	-	o ^{1,2,3,4)}	o ^{1,2,3,4)}	-	-
Modification of device without castors to device with castors		o ^{1,5,6,7)}	o ¹⁾	o ^{1,5,6,7)}	o ^{1,5)}	-	-
Castors with extending feet (levelling castors)		o ¹⁾	o ¹⁾	o ¹⁾	o ¹⁾	-	-
Increased bearing capacity / reinforced frame of the chamber + built-in frame		Δ ¹⁾	-	Δ ¹⁾	-	-	-
Increased bearing capacity of shelves		o ¹⁾	-	o ¹⁾	-	-	-
Increased bearing capacity of the chamber bottom		Δ ¹⁾	-	Δ ¹⁾	-	-	-
Table for the device / Vacustation VU		o ^{1,5,6,7)}	o ¹⁾	o ^{1,5,6,7)}	o ^{1,5)}	o	o
Vacuum pump Vacubrandt MZCNT+AK+EK		-	-	-	-	o	o
Vacuum pump Vacubrandt MD4CNT+AK+EK		-	-	-	-	o	o
Vacuum pump on request		-	-	-	-	Δ	Δ
Special electric port		-	-	-	-	Δ	Δ
Open door alarm		o	o	o	•	o	•
RAMPY		o	o	o	-	o	•
Aggressive heating		o	o	o	o	•	•
Inner socket max. 125°C (230 V, protection 3 A)	08	Δ ¹⁾	-	Δ ¹⁾	-	Δ	Δ

	IND	EC ECO	DC ECO	VC ECO	SC ECO	VU ECO	VU EVO	
Potential-free contact (BMS)- remote alarm 24V/1A		o	o	o	o	o	o	
External flap switching - max. A		o	o	o	o	-	-	
Emergency stop		Δ ¹⁾	Δ ¹⁾	Δ ¹⁾	-	Δ	Δ	
National socket design		Δ	Δ	Δ	Δ	Δ	Δ	
Operation temperature movement [°C]	15	o (+300) ^{5,6)}	-	o (+300) ⁸⁾	o (+300) ⁸⁾	-	o (+300)	
Hot-air sterilization		-	-	o	•	-	-	
Short-time memory - approximately 1 day		•	•	•	•	•	-	
Integrated datalogger > 1 year		-	-	-	-	-	•	
Inert gas connection or aeration		-	-	-	-	manual	•	
Vacuum pump switching by a button		-	-	-	-	•	-	
Automatic vacuum pump switching		-	-	-	-	o	•	
Manual vacuum regulation - manometer +needle valve		-	-	-	-	•	-	
Automatic vacuum regulation (10-1100 mbar) without aeration		-	-	-	-	o	-	
Automatic vacuum regulation (0.1-1100 mbar) without aeration		-	-	-	-	o	-	
Automatic vacuum regulation (10-1100 mbar) with aeration		-	-	-	-	o	•	
Automatic vacuum regulation (0.1-1100 mbar) with aeration		-	-	-	-	o	o	
Digital vacuum display		-	-	-	-	o	•	
Analogue output 4-20mA		o T	o T	o T	o T	o T,p	o T,p	
Software WarmComm 4 Basic (B)		o	o	o	o	o	o	
Software WarmComm 4 Professional (P)		o	o	o	o	o	o	
Software WarmComm 4 FDA (F)		o	o	o	o	o	o	
External printer		o	o	o	o	o	o	
Communicatin software Printer Archive		o	o	o	o	o	o	
Inner temperature measuring, 1-point		o	o	o	o	o	o	
Temperature distribution measuring, 3-point		o	o	o	o	o	o	
Temperature distribution measuring, 9-point (DIN 12880)		o	o	o	o	o	o	
Temperature distribution measuring, 27-point (DIN 12880)		o	o	o	o	o	o	
Validation documentation		o	o	o	o	o	o	
• in standard equipment o optional - cannot be ordered Δ possible, with reservations		o ¹⁾ , • ¹⁾ , Δ ¹⁾ with note ¹⁾ except for volume 22 ²⁾ except for volume 55 ³⁾ except for volume 111 ⁴⁾ except for volume 222 ⁵⁾ except for volume 404						⁶⁾ except for volume 707 ⁷⁾ except for volume 1,212 ⁸⁾ for volume 404, 707 only in stainless steel design ⁹⁾ no light ¹⁰⁾ only inner equipment of the chamber, the chamber is always of 1.4404/316L

WARNING: some combinations of optional equipment are excluded

Explanatory notes:

- EC ECO - ECOCELL® ECO line
- DC ECO - DUROCELL ECO line
- VC ECO - VENTICELL® ECO line
- SC ECO - STERICELL® ECO line
- VU ECO - VACUCELL® ECO line
- VU EVO - VACUCELL® EVO line

Notes

Unique Line... Cell



Designation	Type marking	Laboratory case type	ECO line		Natural air circulation	Forced air circulation	Temperature range in °C (Optional equipment)	Volume 22 (l)	Volume 50 (l)	Volume 55 (l)	Volume 111 (l)	Volume 190 (l)	Volume 222 (l)	Volume 404 (l)	Volume 707 (l)	Volume 1,212 (l)
			EVO line	Line Standard Line Comfort												
drying, tempering, sterilization	ECOCELL®	drying oven	•		•		5*-250/300	•		•	•		•	•	•	
	DUROCELL	drying oven with protective layer of inner space EPOLON	•		•		5*-125	•		•	•		•			
	VENTICELL®	drying oven	•			•	10*-250/300	•		•	•		•	•	•	
	STERICELL® ***	hot-air sterilizer		•		•	10*-250	•		•	•		•	•		
	VACUCELL®	drying oven with vacuum	•				5*-250/300	•		•	•					
incubation	INCUCCELL®	incubator / biological thermostat	•		•		5-100	•		•	•		•	•	•	
	INCUCCELL® V	incubator / biological thermostat	•		•		10-100	•		•	•		•	•	•	
	FRIOCELL®	incubator with cooling	•			•	0-100 (-20)			•	•		•	•	•	•
	CLIMACELL®	incubator with cooling and controlled humidity	•			•	0-100 (-20)			•	•		•	•	•	•
	CO2CELL**	incubator with CO ₂ atmosphere		•	•	•	5*-50		•			•				

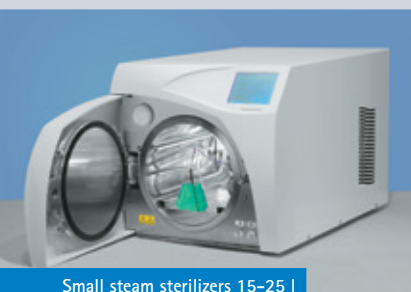
The above stated technical data apply and they are valid at the temperature of 22°C and voltage oscillation ±10%.

* above the exterior temperature

** manufacturer MMM Medcenter Einrichtungen GmbH, Semmlerstrasse 6, D-82152 Planegg / Munich, tel.: +49 89 89 92 26 20, e-mail: medcenter@mmmgroupp.com

*** the STERICELL® line also meets the Directive No. 93/42/EEC, the product is presented in a separate leaflet 0123

Make acquaintance with our further offers...



Small steam sterilizers 15-25 l



Steam sterilizers 140-1,490 l



Steam sterilizers 70 l



Hot-air sterilizers 400-3,900 l



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