CLIMACELL EVO

Climatic Chamber with Forced Air Circulation, Cooling and Controlled Humidity

Innovative Heat Technology
Since its establishment in 1921, BMT Medical Technology s.r.o., the traditional manufacturer of medical and laboratory technology, has been gradually transformed from a small regional company to an international corporation.

In 1992, it became a member of the European MMM Group which has been operating on the world markets since 1954 as an important supplier of systems for the health care industry, science and research. With its comprehensive offer of products and services, sterilization and disinfection devices for hospitals, scientific institutes, laboratories and pharmaceutical industry, MMM Group has established itself as an outstanding quality and innovations producer on the global markets.

The knowledge and experience gained during the implementations of individual supplies for our customers all over the world, and the technical innovations have been permanently and positively influencing the development, construction and production of our devices. High level of our work has also been confirmed by the number of patents and industrial designs as well as an easy implementation of individual device adjustments.

The new generation of the climatic chamber CLIMACELL EVO becomes an ideal tool for simulation of conditions in many fields of human activities. Simple control via touch screen, precise regulation and wide possibilities of data outputs meet the most demanding conditions of pharmaceutical industry and they also allow user friendly simulation of simple requirements for plants growing. The devices offer an interesting alternative for expensive testing chambers and testing rooms. The microprocessor-controlled system of humidification and dehumidification together with high-performance programmable system of exposition lighting guarantee excellent homogenous parameters for tests and growth conditions.

Meeting the requirements of regulations 2006/95/EC, 2004/108/EC, ICH 279/95 Option 2, FDA 21 part 11.

**CLIMACELL EVO**

**Climatic Chamber With a Wide Range of Applications**

Air-conditioned chambers of the CLIMACELL line provide all and any conditions for exact and reproducible simulation of various climatic conditions. Thanks to a wide range of adjustable parameters −20 °C up to +100 °C – of temperature and 10–95 % of humidity, possibility of CO₂ regulation and sterilization at 160 °C and numerous variety of options and accessories, the new generation of the climatic chamber CLIMACELL EVO becomes an ideal tool for simulation of conditions in many fields of human activities.

**Basic Characteristics**

- **Volume:** 111, 222, 404, 707, 1 212 liters
- **Temperature range:** with humidity 10 °C to 90 °C, without humidity 0 °C to 100 °C (options of −20 °C and +160 °C sterilization)
- **Humidity range:** 10–95 %
- **Refrigerant:** R404a (down to −20 °C), R134a (down to 0 °C)
- **Requested water quality:** demineralized water <8 µS/cm (ideally <3 µS/cm)
- **Sealing inner glass door**
- **Interior:** stainless steel, mat. No. 1.4301 (AISI 304)

**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.
- **Zoology**
  - Simulation of conditions for sea organisms research – seaweed or cultivation of insect eggs.
- **Botany**
  - Studies of germination, green plants growing for further research
- **Food and Beverage Industry**
  - Testing of food quality under simulated transport or storage conditions – export of fruits, etc.
- **Packing Material Industry**
  - Long-term testing of packing technologies
- **Electronic Industry**
  - Testing of durability of electronic boards and printed circuits
- **Automotive Industry**
  - Testing of materials ageing – tyres, sealing, etc.
- **Field of Metrology and Quality in Industry**
  - Checking and calibration of industrial measuring gauges
- **Chemical – Industrial**
  - Fertilizers, pesticides, detergents, paint, oil, etc.
**The New Control System Offers**

- 5.7 inch (14.5 cm) touch screen display
- Microprocessor fuzzy logic process control
- Intuitive control via colour icons
- Graphic configuration of a new program
- Transparent displaying of data course at the cycle
- Protective thermostat class 3
- Acoustic and visual alarm
- Multi-level users administration (corresponding to FDA 21 Part 11)
- Keyboard lock against unauthorised handling
- Data encryption and non-manipulability (corresponding to FDA 21 Part 11)
- Up to 100 programs and up to 100 segments for each program
- 30 day data logger in graphic and numeric form
- On-line or offline data export
- Prepared service programs for fast diagnostics of faults
- Easy service diagnostics including remote access
- Multi-language communication
- Direct printing of protocols in PDF format
- Easy user configuration of the device
- SD memory card, USB Host and RS 232 standardly included
- WiFi connection, USB device or Ethernet interface with own IP address for remote data transfer, control and diagnostics (optional equipment)
- Programming of ramps, real time and cycling
- Fan setting 0–100 %
- Main ON/OFF switch for security reasons
- Device functionality LED indicator
- Connectible to all the devices of the MMM Group
- Stable platform of the SQL library
- User-friendly environment
- Connection of up to 25 devices
- Bilateral communication – data monitoring and device control
- Compatibility with older lines of heat technology devices
- Client-Server architecture
- Service module for local and remote diagnostics
- Three levels depending on client’s requirements (B-P-F)
- Compliance with FDA CFR 21 Part 11 (version F)
- Web support, on-line updates
- Protected licence policy
- Unpretentious to HW requirements, compatible with MS Windows and UNIX

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**Connectivity**

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

**Data Outputs**

Thanks to the most up-to-date components of electronic, the device CLIMACELL does not have any data peripherals connection limit. The basic configuration contains traditional and reliable RS 232, USB Host and the SD card as the data carrier. The device can be easily extended with the WiFi 802.11b/g module with up to 100 meters reach, there is also available the USB device for bi-directional USB communication and for remote connection there is the Ethernet (RJ 45) connection. Proper IP address allows easy connection to PC or selected WIFI printer, respectively other usual data periphery (Smartphone, Netbook, etc.). Thanks to the open platform and adjusted data format it is also possible to configure remote connection and to work with on-line data in remote mode (internet).

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**WarmComm 4.0**

Universal Data Administration with Devices of the MMM Group

- Integrated data logger, SD card
- Compatible thermo-printer via RS 232
- Specified desk-top printer (USB/WiFi)
- BMS remote alarm
- Smartphones CLC monitor

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**CLC Monitor**

- Connection of software WarmComm 4.0
- RS 232
- USB Host
- USB Device
- WIFI (optional equipment)
- Ethernet / Internet (optional equipment)
- SD card
- BMS remote alarm
- Data Outputs

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CLIMACELL EVO

Comfort Machine with Superior Parameters

MMM Group offers traditionally fully ranged size of the cabinet, from personal size 111 litres, up to new size 1 212 litres, with the best ratio cost/performance. Patented vertical air flow with preheating chamber and asymmetrically perforated panels ensure the well proven vertical spiralled air flow with the best spatial homogeneity.

Deep experience of the factory engineers and many years of careful development help with sophisticated fuzzy logic control system. By means of the fuzzy logic are continually evaluated the current process conditions as size of chamber, set parameters, quantity of the samples inside and herewith optimizing heating, cooling and steaming performance.

High pressure steam generator in new easy accessible position and newly designed powerful freezing coil regulate the relative humidity quickly in full range from 10–95 % RH, according the customer set, and without significant temperature interference.

Practical large and popular door handle, robust wheels with brakes and 170° openable main door(s) contributes to high user friendly character of the device. Light grey with light blue device colours highlighted by dark blue smiley control panel cause a pleasant feeling of harmony in the user every morning.

New smart design with user-friendly panel, Sun-sensor for reliable and exact results, Touch screen with graphic interface, SD memory card for data transfer, Wifi connection for wireless connection to PC / SMARTPHONE (optional equipment), Fuzzy logic microprocessor control for start time minimisation, Improved fixation of the upper construction for easy service access, Effective LED diodes (up to 30 000 lx) low-temperature programmable exposition lighting (optional equipment), Stainless steel chamber (AISI 304) making regular de-contamination of the device easier, Easily removable inner panels for easy chamber cleaning, Heating and cooling elements placed in the pre-chamber with maximal transfer surface for efficient heat exchange, Inner fully insulated glass door made of safety glass Security Izolas according to EN 12150-2:2004, Castor with a break for easy and safe device handling, Ergonomic door grip with new mechanics for easy and safe door closing, Main switch ON/OFF safe device stopping, Remote service diagnostics using proper IP address, SD memory card for data transfer, Wifi connection for wireless connection to PC / SMARTPHONE, Increased maximal temperature up to 160 °C for the chamber sterilisation (optional equipment), Automatic defrosting system (optional equipment), Powerful high-pressure (2 kPa) steam generator for exact humidity control, Vertical construction of the case means space savings in your lab, 5 -layer efficient chamber insulation for long-term stability of parameters in the chamber, Adjusted de-humidification system for fast Rh change in the chamber, Improved cooling system for shorter recovery times, Unique vertical programmable system of air flow in the chamber for precise conditions of the process and short recovery times, Four-point adjustable door fixation for perfect door sealing, Increased maximal temperature up to 160 °C for the chamber sterilisation (optional equipment), High-end RH sensor Rotronic for reliable and exact results.
Programmable Lighting

The new generation of climatic chamber CLIMACELL EVO offers wide possibilities of light options applications. Together with control of temperature, humidity, ventilation or CO₂, it is possible to control and program even intensity of visible or ultra-violet exposure in the form of LED diodes.

Light Shelves

In case of testing the photo-stability for pharmaceutical industry, the most suitable option is the use of light shelves for exposition of samples. The lighting is in compliance with standards ICH Q1A and Q1B, Option 2 and relevant European standards. There are available light shelves with visible light, ultra-violet light and their combinations. It is possible to set different temperature or humidity for each segment and accordingly, it is possible to set different level of lighting for each segment. That allows programming of cycles of day and night simulations with gradual light intensity increase and decrease.

Exposition Lighting in Doors

For applications with necessary equal lighting of the chamber, for example for plants growth, there is available an option with lighting in the device door. Just like in the light shelves, even exposition light in door allows separate regulation for each segment within the range of 0–100 % in steps of 10 %.

Light Sensors

To meet the most strict requirements for light exposition measurability there is available the option of light sensors. One type of sensors is able to exactly measure the quantity of visible and the other the quantity of ultra-violet light. In case of such sensors installation it is possible to follow exact exposition doses received by samples on a display, in graphs or in the software WarmComm 4.

Light Spectrums Available

As there extend the possibilities of LED diodes manufacturers, there also extend the possibilities of their use in CLIMACELL EVO. Together with usual possibilities of visible (white) light or ultra violet light we will try our best to get even LED diodes meeting your requirements towards other light colours. Please do not hesitate to contact us in such cases and we will be glad to discuss the possibilities with you.

Humidity Control

CLIMACELL EVO is a climatic chamber – i.e. a device that is able to exactly and quickly regulate the quantity of humidity in the chamber. This is possible thanks to strong system of active increase and decrease of humidity in connection with the system of water supply to the device.

Steam Generator

The device allows steam generation and its precise dosing to the chamber. Thanks to our long-term experience in the field of steam sterilisation we succeeded to develop pressure steam generator able to increase relative humidity in the chamber in a precise, reliable and fast way. Steam overpressure is generated in the water reservoir using the heating element. Then, the valve releases exact volume of steam to the chamber. The technology eliminates the overshootings while reaching required level of relative humidity.

Humidity Reduction

Unlike many other manufacturers we are not engaged only in humidity increase, but we also focus on active humidity decrease, using the separate cooling snake of the cooling system. The control system of CLIMACELL EVO is able to reduce humidity in the chamber using the cooling system while keeping a nearly constant temperature. The humidity on the cooling coil condensates and condensed water is taken back to the steam generator where the pump releases it to the water waste. Thanks to the efficient system CLIMACELL EVO reaches even the low relative humidity values very quickly.

Water Intake and Use

In order to create the humidity exactly and reliably in the long term, the steam generator of CLIMACELL EVO operates only with demineralized water. The access to such water can be solved in two ways. A standard solution means that you pour demineralized water to a barrel, delivered with each CLIMACELL EVO and you connect the pump from the barrel to the connector on the rear side of the device. The other possibility includes connection of demineralized water intake from the laboratory water distribution system to the steam generator of CLIMACELL EVO via reduction pressure valve. In both cases, the device automatically takes exact quantity of water as needed for humidity creation in the steam generator.
Accessories Included

Each CLIMACELL EVO is supplied with standard equipment which does not have to be additionally ordered and it makes a standard part of delivery:

## Optional Equipment

Thanks to modular construction of our devices even CLIMACELL EVO may be additionally equipped according to your preferences with many additional options. CLIMACELL EVO may then serve as a chamber for testing of photo-stability, light simulation of day and night, processes with CO₂ control, hot-air sterilisation, etc.

1. Hot-air sterilisation 160 °C
2. Additional cooling −20 °C
3. Flexible temperature sensors
4. LED light shelves
5. Exposition lighting in doors
6. Light sensors of exposition
7. Defrosting system
8. CO₂ control
9. Software WarmComm 4
10. Data module USB device, Ethernet, wi-fi
11. Mechanic door lock
12. Electromagnetic door lock
13. Trays or shelves
14. Access port Ø 25, 50, 100 mm
15. Programmable inner socket
16. External printer
17. Multi-point temp. / humidity measuring
18. IQ/DB protocols

### Technical Parameters

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<th>CLIMACELL EVO (CLC EVO) 111, 202, 404, 707, 1212</th>
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<td><strong>Technical data</strong></td>
</tr>
<tr>
<td>width mm</td>
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<tr>
<td>depth mm</td>
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<td>height mm</td>
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| **Volume of the steam space** | cca l | 167 | 305 | 530 | 878 | 1753 |

| **Trays of stainless steel** | max. No. | 7 | 10 | 19 | 19 | 3x19 |
| standard equipment pcs. included | 2 | 2 | 2 | 2 | 6 |
| min. distance between trays mm | 70 | 70 | 70 | 70 | 70 |

| **Maximal weight of the load** | per tray max. kg/tray | 20 | 30 | 30 | 50 | 30 |
| loading capacity in total kg/unit | 50 | 70 | 100 | 130 | 200 |

| **Door** | number of outer metal doors | 1/1 | 1/1 | 1/1 | 2/2 | 2/3 |
| number of inner glass doors No. | 1/1 | 1/1 | 1/1 | 2/2 | 2/3 |

| **External dimensions** (including door, handle and Rolls) | width mm | 780 | 780 | 1100 | 1500 | 2630 |
| depth mm | 840 | 980 | 950 | 950 | 950 |
| height mm (incl. Rolls) | 1360 | 1630 | 2070 | 2070 | 2105 |

| **Weight CLC EVO 0 °C** | net cca kg | 110 | 140 | 240 | 290 | 340 |
| brut cca kg | 140 | 177 | 280 | 326 | - |

| **Weight CLC EVO −20 °C** | net cca kg | 120 | 153 | 250 | 290 | 340 |
| brut cca kg | 150 | 127 | 290 | 336 | 395 |

| **Electricity** | max. power CLC EVO 0 °C W | 2050 | 2100 | 3150 | 3400 | 3400 |
| max. power CLC EVO −20 °C W | 1630 | 1780 | 2115 | 2640 | 3215 |
| mains 50/60 Hz V | 230 | 230 | 230 | 230 | 230 |
| protective system IP | IP 20 | IP 20 | IP 20 | IP 20 | IP 20 |

| **Temperature data** | from 0.0 °C to −20.0 °C | cca °C | -0.4 | -0.4 | -0.9 | -0.9 |
| from 37.0 °C to 37.0 °C | cca °C | -0.9 | -0.9 | -1.5 |
| in time cca °C | 0.2 | 0.2 | 0.3 | 0.4 | 0.8 |

| **Temperature accuracy** | in space at 10 °C °C | 0.4 | 0.4 | 0.5 | 0.5 |
| at 25 °C °C | 0.4 | 0.4 | 0.5 | 0.5 |
| in time cca °C | 0.2 | 0.2 | 0.3 | 0.4 | 0.8 |

| **Heating/up time to 37 °C from the ambient temperature** | min | 20 | 25 | 26 | 27 | 30 |
| Cooling/down time from 22 °C to 10 °C | min | <21 | <21 | <21 | <21 | <21 |
| Recovery time after 30 s of door opening according to DIN 12 880 | min | 4 | 4 | 4 | 4 | 4 |
| according to DIN 12 880 | min | 5 | 4 | 4 | 4 | 4 |

| **Relative humidity CLC EVO range** | % | 10–95 | 10–95 | 10–95 | 10–95 | 10–95 |
| Complete device noise level dB | 46 | 50 | 56 | 58 | 60 |
| **CO₂ concentration** | % | 0.1–20 |
| **Required pressure CO₂** bar/psi | 0.3–0.7/10– |

*) Approx. 50 % of the tray area can be filled in a way a uniform air circulation is enabled inside the chamber.

**Note:** All technical data are related to 22 °C ambient temperature and ± 10% voltage swing (if not specified).

For other parameters see section Electric connections. There occurs temperature and humidity variation in case of regular turbidity removal during the operation.

Change in the design and make reserved.
Make Acquaintance With Our Further Offers ...

**Laboratory Ovens and Incubators**

- **INCUCELL / INCUCELL V**
  Suitable for safe treatment of microbiological cultures

- **FROCELL**
  Cooling incubators

- **CLIMACELL**
  Climatic chambers

- **CO2CELL**
  CO₂ atmosphere

**Sterilization and Depyrogenation**

- **VENTICELL IL**
  Series of modular large-sized laboratory devices with the chamber volume of from 700 to 2000 liters. The devices are used for items sterilization at the temperature of up to 180 °C, or for items depyrogenation at the temperature of up to 300 °C and optional time mode. The devices can be used in laboratories, industry, pharmacy and research.

- **ECOCCELL**
  The highly cost-effective heating oven series for simple drying processes

- **DURCELL**
  Special-purpose drying ovens

- **DUROCELL with highly resistant EPOLON coating**

- **VACUCELL**
  Vacuum drying ovens

- **STERICELL**
  Intended for hot air sterilization of materials under specified temperature and duration.

- **VENTICELL**
  Drying ovens with forced air circulation

**Steam Sterilizers (Autoclaves)**

- **STERILAB**
  Small steam sterilizer, 25 l

- **UNISTERI HP IL**
  Medium-sized steam sterilizers, 73–254 l

- **STERIVAP HP IL**
  Large steam sterilizers, 148–1490 l