



MMM Group

VENTICELL IL

Hot-Air Sterilizer with Depyrogenation
In Laboratories, Pharmacy and Industry



protecting human health

Tradition, Quality, Innovation

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.

Individually Designed Laboratory Technology

VENTICELL II is a series of modular large-sized laboratory devices with the chamber volume of from 400 to 1 500 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. VENTICELL II is intended for thermally resistant, inflammable materials, e.g.:

- empty glass products – glasses, ampoules, bottles, vessels and others
- metal materials in pharmaceutical industry – trays, containers, accessories and device parts
- thermally stable basic pharmaceutical products and chemical substances

General and Actively Provable Quality

A factory acceptance test (FAT) is taken for granted; a site acceptance test (SAT) can also be performed upon the user's request and in his presence. 27-point measurement according to DIN 12880 can also be performed during the output control. To prove the sustained sterilization quality by the manufacturer (importer) in accordance with the declared device parameters, VENTICELL II hot-air sterilizer users are provided with appropriate documents: IQ – Installation Qualification
OQ – Operational Qualification
PQ – Procedural Qualification (validation)
The testing and validations are performed by our accredited testing laboratory according to the standards.

VENTICELL II Original Without Compromises

- modular system allows a variable device construction
- one-door and two-door models
- sterilization chamber, doors, device frame and jacket are made of stainless steel for easy maintenance and long life
- double automatic door lock for the maximum process safety
- horizontal air flow in the chamber, powerful heating elements and highly efficient device insulation ensure short working process times and reduction of the operating costs
- control by means of an industrial PLC system
- sterilization phase checking both in digital and analogue form during the whole working cycle
- simple, intuitive device control by means of a touch panel with custom modification of process parameters
- various possibilities of the batch documentation processing
- regulation of pressure inside the chamber by means of sensors depending on the air pressure in the sterile or non-sterile space
- doubled main temperature sensors for an independent work process control
- doubled auxiliary temperature sensors for better process control
- effective use of the inner sterilization space
- transporting and loading system guarantees easy handling of the sterilized material by the operator
- wide offer of optional accessories according to individual needs



laboratories

pharmacy

industry

research

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 utility and industrial designs as well as an easy implementation of individual device adjustments.

The device concept is based on the requirements of the standard EN 61010-2-040 and can be adjusted according to the individual needs of each worksite. The device is designed and manufactured in the certified quality assurance system in accordance with EN ISO 9001.



MMM Group
– excellence in medical
and laboratory technology

Sterilization and Depyrogenation

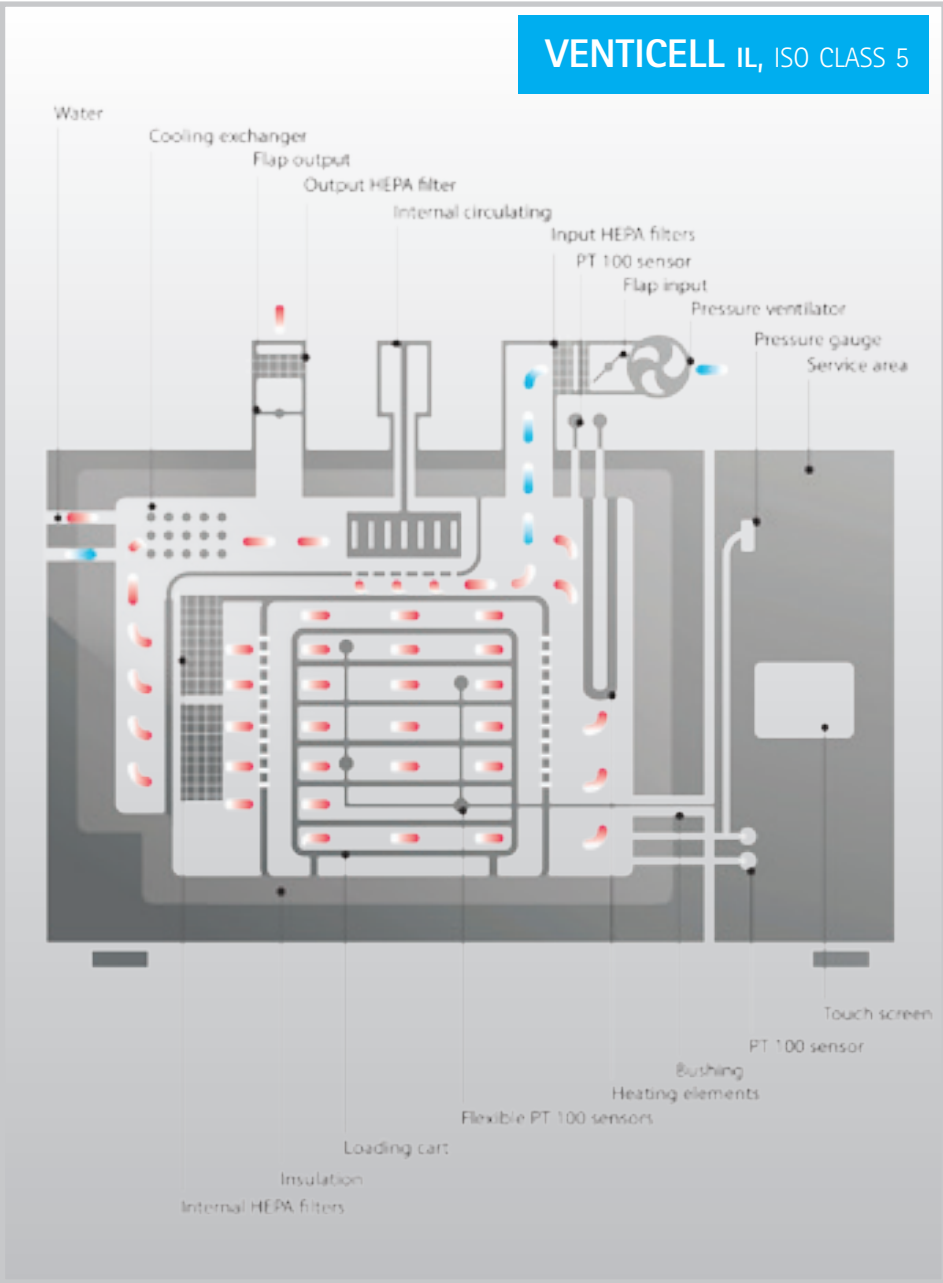
Sterilization is a procedure killing all viable organisms including spores and leading to irreversible inactivation and killing of health-endangering worms and their eggs. The number of Bacillus subtilis microorganisms must be reduced during a sterilization cycle by six orders at least. The sterilization effect in hot-air sterilizers is reached by the sterilized material heating to a high temperature (160–180°C). Depyrogenation is a procedure reducing the number of bacterial endotoxins (pyrogens) by three orders at least by high temperature (250–300°C) acting for a given period of time.

There are the following important parameters of the mentioned processes:

- accurate profile thanks to a well-designed hot air flow system and perfect construction design of the sterilization chamber
- quick temperature rise and cooling
- compliance with the regulations on clean premises

ISO CLASS (N)	Classification of air cleanliness according to ISO 14644-1					
	0,1 µm	0,2 µm	0,3 µm	0,5 µm	1 µm	5 µm
ISO CLASS 1	10	2				
ISO CLASS 2	100	24	10	4		
ISO CLASS 3	1 000	237	102	35	8	
ISO CLASS 4	10 000	2 370	1 020	352	83	
ISO CLASS 5 (class 100)*		23 700	10 200	3 520	832	29
ISO CLASS 6	1 000 000	237 000	102 000	35 200	8 320	293
ISO CLASS 7 (class 10,000)*				352 000	83 200	2 930
ISO CLASS 8				3 520 000	832 000	29 300
ISO CLASS 9				35 200 000	8 320 000	293 000

* according to previous norm US FED STD 209 E cancelled 29th November 2001

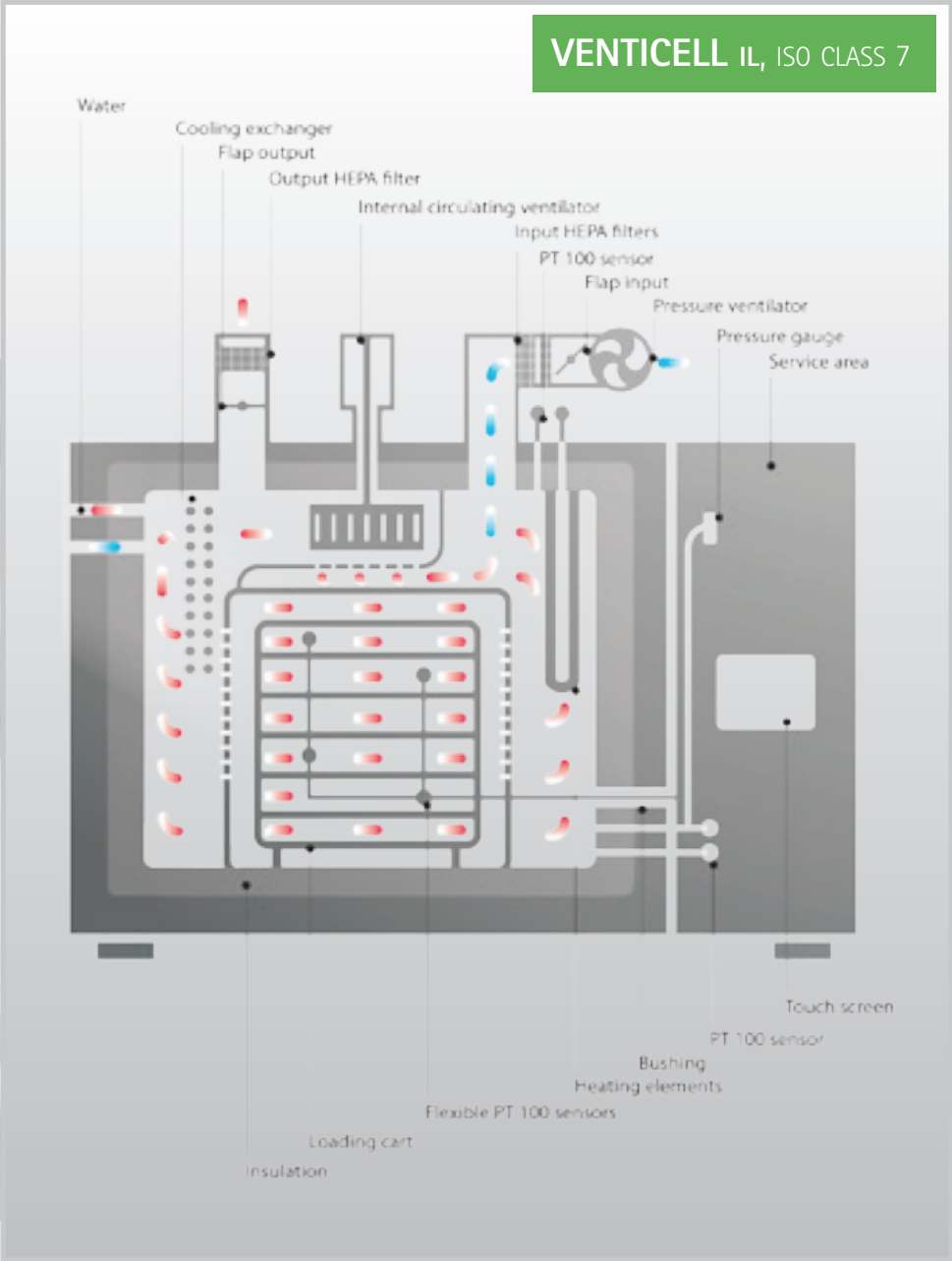


VENTICELL IL ISO CLASE 5

- complies with the regulations on clean premises according to ISO 14644-1
- special external HEPA filters at the input and special internal thermally-resistant HEPA filters
- well-designed construction of the sterilization chamber
- loading equipment
- guarantee of compliance with ISO Class 5 in all sterilization chamber zones
- working temperature of up to 300°C
- sterilization chamber volume 1 500 and 700 liters
- one- and two-door models
- stainless steel device wall panels

VENTICELL IL ISO CLASS 7

- complies with the regulations on clean premises according to ISO 14644-1
- special external HEPA filters at the input
- well-designed construction of the sterilization chamber
- loading equipment
- guarantee of compliance with ISO Class 7 in all sterilization chamber zones
- working temperature of up to 300°C
- sterilization chamber volume 1 500 and 700 liters
- one- and two-door models
- stainless steel device wall panels



VENTICELL IL EASY

VENTICELL IL EASY, an economical variant of the hot-air sterilizer, complies also with the conditions for installation in clean premises. It complies with the requirements of EU Directives 2006/95/EC and 204/108/EC. The device construction is based on the established and well-proved MMM heat technology devices (COMFORT line) and is intended for a long-term use in the hot-air sterilization and depyrogenation processes with necessary technical adjustments. (For more details see p. 10)



VENTICELL IL

High Standard of Manufacture

- robust outer covering, valuable inner space
- stainless steel sterilization chamber [DIN 1.4301 (AISI 304)] or [DIN 1.4404 (AISI 316L)]
- robust multi-piece stainless steel device frame for easy device installation
- stainless steel outer jacket made of high-strength, chemically resistant, polished steel DIN 1.4301 (AISI 304) or DIN 1.4404 (AISI 316 L) for easy maintenance and long life
- removable inner stainless steel wall panels for easy maintenance of the working chamber
- clear ergonomic control panels
- easy intuitive control and service
- automatically controlled stainless steel door with mechanical opening/closing
- bacteriological HEPA filters for the working chamber aeration
- special internal thermally-resistant HEPA filters
- internal pressure ventilator with sealed shaft
- temperature sensors PT100 for accurate temperature maintenance (4 pieces as a standard)

- optional integration of flexible PT 100 sensors
- digital- or analogue-display pressure sensors for pressure measurement and regulation in the sterilization chamber and for the ambient pressure comparing
- "Total stop" function integrated in the control panel, in emergency, the device comes to a standstill
- strengthened water cooling by means of a cooling exchanger inside the chamber
- possibility of use of a transporting and loading system in all device types
- service access from the front and one side wall only
- flexible positions of input and output flanges facilitating the device connection at the installation site
- wide range of optional accessories

Sterilization Chamber

- made of chemically resistant stainless steel DIN 1.4301 (AISI 304) or DIN 1.4404 (AISI 316 L)
- tight sealing welds of the sterilization chamber
- highly polished sterilization chamber surface minimizes particles deposition and makes cleaning easy
- easy removable inner stainless steel panels for easy maintenance of the sterilization chamber
- well-designed construction of the chamber and door to maximize the dilatation stability of the chamber during the working cycle, which eliminates the particles release and increases the temperature homogeneity in the sterilization chamber
- high-quality, 15 cm thick insulation Rockwool and the third outer insulation jacket
- rectangle chamber ensures the maximum volume usability for standardized containers placement
- to allow the device validation, the sterilization chamber can be equipped with a bushing of 30 mm diameter

Device Door

- double automatic door lock for the maximum process safety
- semi-automatically controlled stainless steel door with mechanical opening equipped with a unique two-stage hinge allowing easy door opening and reliable closing
- welded door construction has a double, heat-resistant, silicone labyrinth sealing which eliminates fully the contact of the inner environment with the outer one during the working cycle
- easy the door sealing replacement
- stainless steel electromotive door lock using the great door weight, which ensures reliable door closing
- two ergonomically positioned handles for easy door manipulation
- emergency door opening allowed by independently supplied electromotors, or by a manual drive in case of power supply failure
- one- or two-door (pass-through) models available



VENTICELL IL

Unique Heat Transfer Inside The Working Chamber

- The activity is based on a horizontal air flow through air ducts in the back and side device walls by means of a ventilator in an electrically heated chamber. Thus the air temperature deviation ($\leq \pm 1\%$ from the temperature reached) and accurate temperature profile are ensured.
- Well-designed placement of the ventilation air ducts, heating elements, internal ventilator and controllable air suction flap allow very short duration of the temperature rise and accurate cycle course in the sterilization chamber.
- Forced air cooling by an integrated ventilator during the final cycle phase ensures the resulting reduction of the working cycle duration (e.g. 320 bottles ROUXE 1000 ml, sterilization 250°C / 30 minutes, cooling by air to 90°C, cycle duration 4 – 6,3 hours depending on the flow intensity).
- Temperature range up to 300°C allows the device use in the whole spectrum of industrial applications including the hot-air sterilization and depyrogenation.

Filters, Overpressure, Particles

- Thanks to special two-stage HEPA filters of class H 11 and H 14 placed at the air inlet into the device, the requirements of the standard EN 14644 Class 7, have been met.
- The use of thermally resistant internal HEPA filters H 13 and a continuous regulation of the space air velocity ensures an absolutely perfect continuous cleaning of the inner chamber, thus reducing the particles occurrence during all cycle phases (applied only to VENTICELL IL, ISO Class 5), which means compliance with EN 14644, ISO Class 5.
- An additional pressure ventilator ensures the overpressure of up to 2 mbar.
- Thorough door sealing and special sealing of the ventilator axis eliminates any contact with the outer atmosphere during and after the sterilization cycle.
- The output device pipes can be equipped with additional H 13 filters to protect the laboratory environment.



laboratories



pharmacy



BSL 3 / BSL 4

Transporting and Loading System

The sterilized material handling is facilitated by a loading system consisting of a transporting and loading cart. The transport cart construction has been designed to ensure a very stable load handling, even if it is quite heavy. The loading cart with shelves of optimized size for standardized containers loading is equipped with wheels with special thermally resistant bearings, which guarantees the load placement into the device without any risk of particles release from the cart. The loading device construction allows continuous air flow in the chamber, thus contributing to the working cycle duration shortening and temperature homogeneity increase in the sterilization chamber.

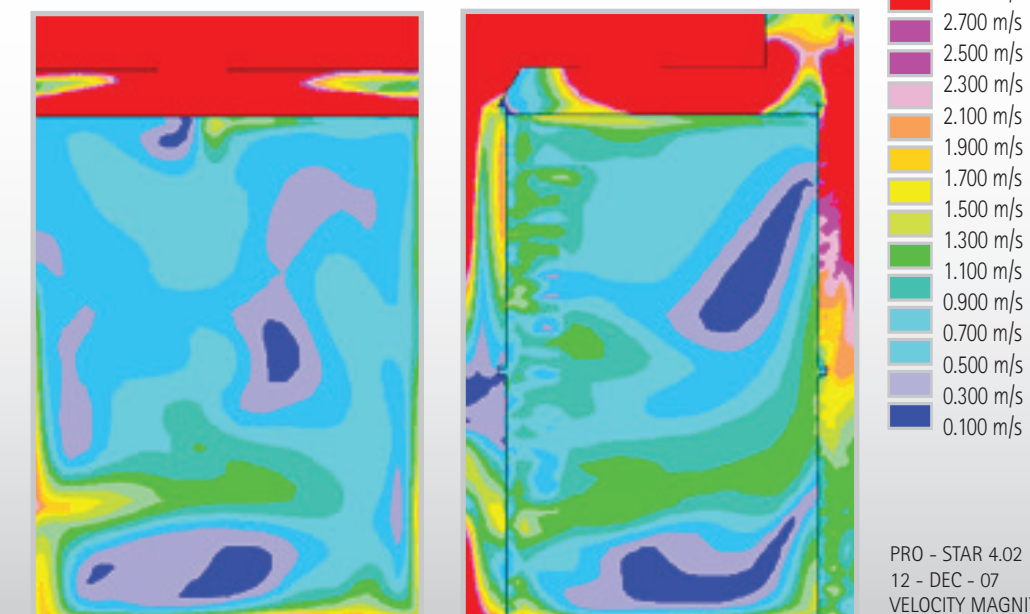
Environmental Awareness

Both the device production and the devices as such comply with the strictest ecological criteria. They do not burden the working and living environment. Multi-stage controlled cycle and continuous regulation of the revolutions rise and run-out prevent useless power surges in the customer's power supply mains.

The design of the device construction, e.g. an effective flow in the chamber, perfect and extremely thick outer insulation of the sterilization chamber by the rock wool, ventilator axis sealing, or settable suction an exhaust flaps not only optimize the cycle parameters, but also minimize energy consumption and protect the user's premises from uselessly radiated heat. The heat insulation keeps its perfect insulating properties even in high temperatures when it retains low temperature absorption. During operation, it does not release any smell or smoke emission because it contains neither binders, nor lubricants. The device does not produce any harmful by-products. Ecological processing methods are used during its production.

More than 90% of the device and its pack are recyclable. The device contains neither any harmful substances nor heavy metals and complies with the directive on the restriction of the use of hazardous substances and wastes no. 2002/95/EC and 2002/96/EC. The device also complies with the WEEE&ROHS regulations on industrial products recycling.

Simulation Of Air Flow Velocity in The Chamber



The latest simulation methods of air flow in chambers were used during the development in cooperation with the Brno University of Technology (Czech Republic).

PRO - STAR 4.02
12 - DEC - 07
VELOCITY MAGNITUDE [m/s]
ITER = 1500
LOCAL MX = 26,65 m/s
LOCAL MN = 0,5442E - 01 m/s

Intuitive Touch Control Panel

Unique Properties, Safe Working Operations

- high operational safety, doubled system of collection and evaluation of process information and its continuous comparing and evaluating
- control by an industrial PLC system with own control software

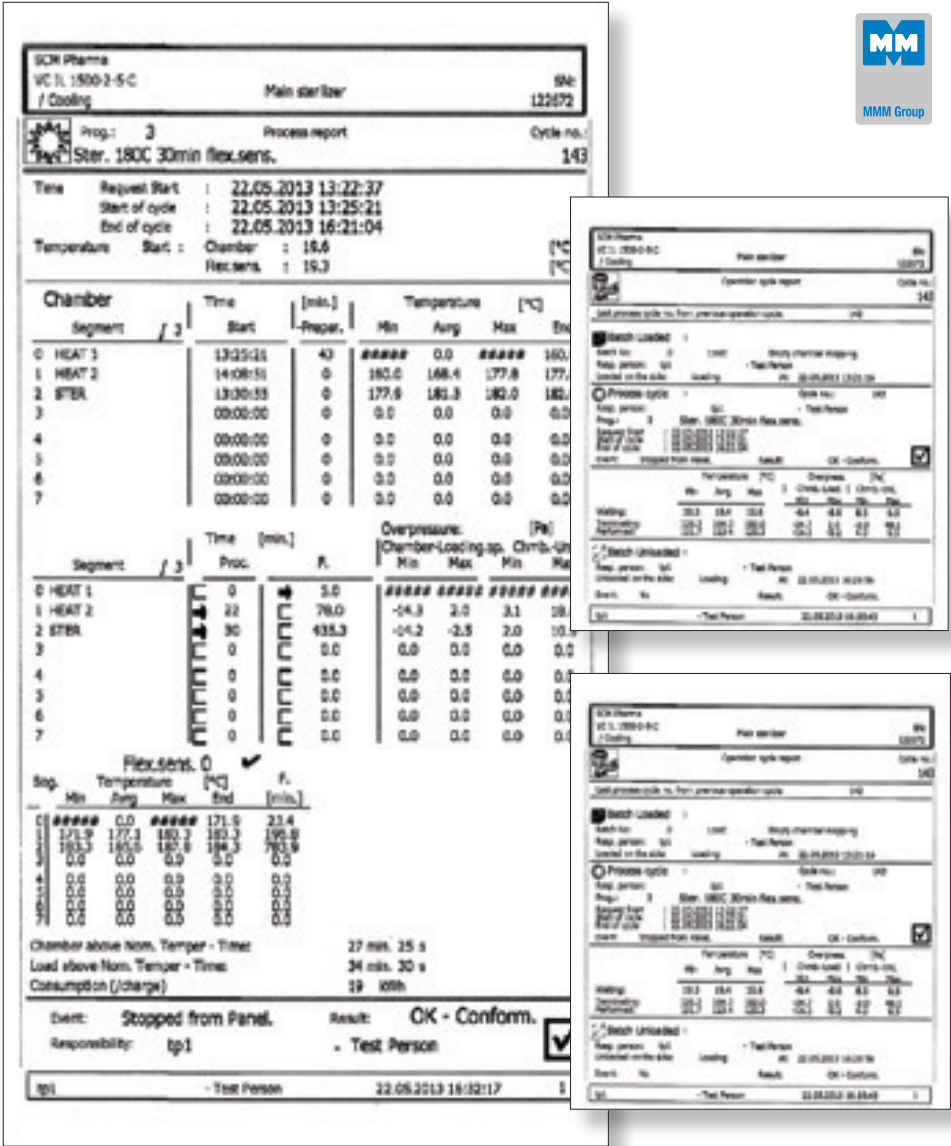
Control System Plc – Siemens

- basic device functions on both device sides (in a two-door model) and extended user functions offered on the main panel
- main comfortable color 10" touch panel ensures a clear and simple operation, diagnostics and service at the loading side
- color 5.7" touch display on the unloading (clean) side (in a two-door model) informs also about the process state and allows the basic device control to the operator
- visual and acoustic states and processes signaling (during the process, the display shows the process course and time till the working cycle end in both digital and analogue form) – optional accessory
- visually and acoustically settable alarms and a number of individual configuration settings (ventilator, air flaps, communication language, print or data output, flexible PT sensors control etc.) are a common part of the device
- clock – indicator of the time remaining till the program end; real time indicator
- after the cycle ends, the automatics confirms the correct course, offers a protocol print for the given cycle and allows the device door opening
- the "delayed start" function allows the device switch-on in a pre-defined time without the operator's presence
- the diagnostic section allows an easy service diagnostics and very quick service intervention
 - process control according to FD parameter

Batch Documenting

In addition to both the local and remote checking of the working processes, the working cycle documenting is required in certified operations. It is ensured by:

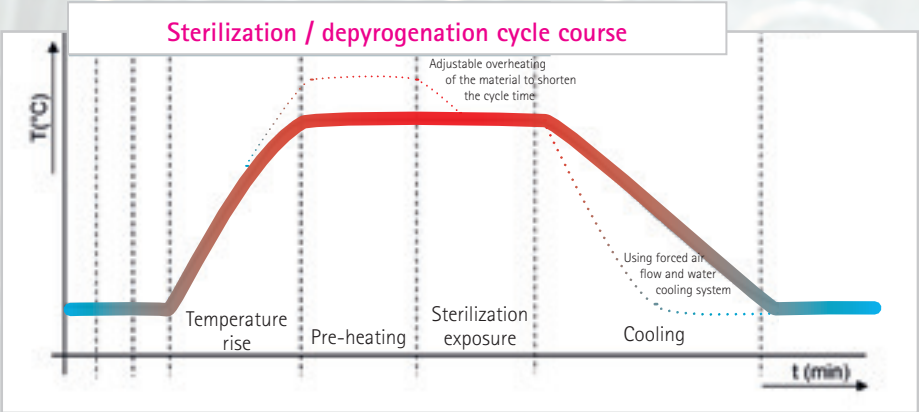
- independent documentation allowing the storage of more protocols into the device memory
- integrated thermal printer (optional)
- connection of an external A4 printer for protocols printing in a standard format
- connection to a PC (RS 232, Ethernet, USB – interface for connection of a keyboard, mouse, printer, bar code reader etc.) for data exchange or remote diagnostics and protocols storage in the device memory by means of the Printer Archiv software (optional)
- WIFI module for wireless connection to a computer or printer allowing actual data transfer



WarmComm 4.0

special software for MMM heat technology – efficient access to your data
The special WarmComm software allows data storing and managing in a PC simultaneously with the device memory.

On-line support: <http://warmcomm.bmt.cz>



Optional Equipment

- one-door or two-door (open-through) model
- use of better-quality stainless steel 316 L with higher dilatation resistance minimizing the dimensions changes caused by higher temperatures
- mirror polished chamber
- water aftercooling – increases the efficiency of work with the device and shortens the aftercooling duration up to a half
- output HEPA filter including a special output neck
- HEPA filter Class H 13 or H 14
- 1

transporting and loading equipment made of stainless steel AISI 304 or AISI 316 on request, provided with special resistant wheels and dust-free bearings
- the loading cart is optimized for usual container sizes, or it can be adjusted according to the user's requirements
- validation port of diameter according to the user's requirements
- 4

integrated thermal printer with 10-year guarantee of the print permanence data storing and print width of 113/104 mm
- external printer for A4 protocols printing
- 2/3

additional flexible temperature sensor PT 100 for control
- additional pressure sensors with digital or analogue displaying
- 5

additional flexible temperature sensor PT100 for the process control and check at the given site of the chamber
- data outputs RS 232, RS 485, GSM, Wifi or USB for external data loggers and printers connection
- 6

controlled internal ventilator with a two position switch for the flow optimization in the chamber

- special recording WarmComm software for data storing and management in a PC – in combination with RS 232 only
- compatibility with 21 CRF part 11 and GAMP4 with outputs to a touch display or SW Warmcomm 4.0
- gas-tight model "Bio-Seal"
- basic IQ, OQ, and PQ documentation for validation



... fulfillment of your requirements

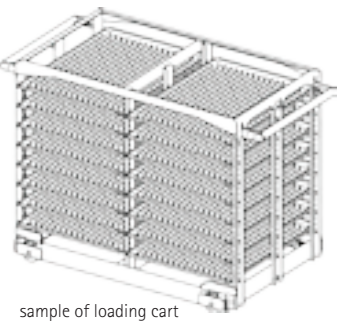
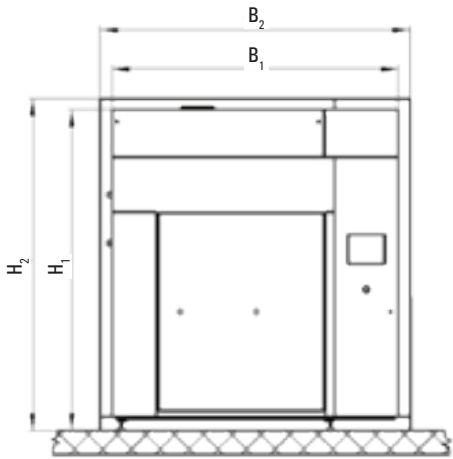
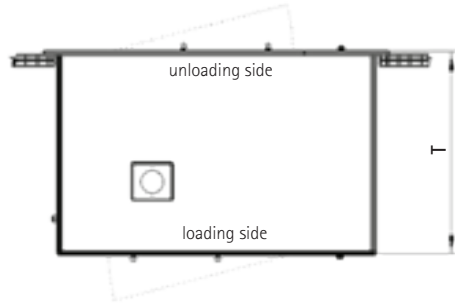
Technical Parameters

Model VC IL	Volume (approx) [l]	Dimensions (h×w×d)* [mm]		Device weight [kg]	Number of shelves positions in chamber/load cart**	Mutual shelves distance [mm] in chamber/load cart**	Maximum permissible tray/shelf load [kg]	Maximum permissible overall load [kg]	Maximum device power input [kW]	Temperature range [°C]	Minimum heating time to 250 °C / min-empty chamber	Maximum temperature time variation acc. to DIN 12 880 [°C]	Maximum temperature space deviations acc. to DIN 12 880 [°C]	Heat radiated to environment at 250 °C cca [W]	Corresponds to ISO 14644-1
		outer	inner												
2000 – 1	2000	2727×2409×1900	1500×900×1500	2030	–/15	–/68	19/38	480	50,5	300	60	+/-0,5	+/-2	9 000	ISO CLASS 5
2000 – 2	2000	2817×2612×1900	1500×900×1500	2130	–/15	–/68	19/38	480	50,5	300	60	+/-0,5	+/-2	9 000	ISO CLASS 5
1500 – 1	1500	2727×2409×1540	1500×900×1140	1730	–/15	–/68	19/38	480	38,5	300	60	+/-0,5	+/-1,5	7 000	ISO CLASS 5
1500 – 2	1500	2817×2612×1540	1500×900×1140	1830	–/15	–/68	19/38	480	38,5	300	60	+/-0,5	+/-1,5	7 000	ISO CLASS 5
700 – 1	700	2079×2191×1540	900×732×1140	1240	–/8	–/68	20/40	400	25	300	55	+/-0,5	+/-1,5	4 500	ISO CLASS 5
700 – 2	700	2168×2395×1540	900×732×1140	1300	–/8	–/68	20/40	400	25	300	55	+/-0,5	+/-1,5	4 500	ISO CLASS 5
2000 – 1	2000	2727×2037×1900	1500×900×1500	1790	–/15	–/68	19/38	480	50,5	300	45	+/-0,5	+/-2	9 000	ISO CLASS 7
2000 – 2	2000	2817×2239×1900	1500×900×1500	1890	–/15	–/68	19/38	480	50,5	300	45	+/-0,5	+/-2	9 000	ISO CLASS 7
1500 – 1	1500	2727×2037×1540	1500×900×1140	1490	–/15	–/68	19/38	480	38,5	300	45	+/-0,5	+/-1,5	6 000	ISO CLASS 7
1500 – 2	1500	2817×2239×1540	1500×900×1140	1590	–/15	–/68	19/38	480	38,5	300	45	+/-0,5	+/-1,5	6 000	ISO CLASS 7
700 – 1	700	2079×1828×1540	900×732×1140	1140	–/8	–/68	20/40	400	25	300	45	+/-0,5	+/-1,5	4 000	ISO CLASS 7
700 – 2	700	2168×2032×1540	900×732×1140	1160	–/8	–/68	20/40	400	25	300	45	+/-0,5	+/-1,5	4 000	ISO CLASS 7
707 – 1	700	1910×1160×790	1410×940×540	215	19/18	70/36	50	200	4,9	250/300***	64	+/-0,4	+/-2,5	2 550	not stated
707 – 2	700	1910×1160×806	1410×940×540	250	19/18	70/36	50	200	7,2	250/300***	50	+/-0,4	+/-2,5	2 550	not stated
404 – 1	400	1910×760×790	1410×540×540	150	19/18	70/36	50	200	3,7	250/300***	58	+/-0,4	+/-1,5	1 940	not stated
404 – 2	400	1910×760×806	1410×540×540	160	19/18	70/36	50	200	5,5	250/300***	43	+/-0,4	+/-1,8	1940	not stated

Chamber xxx-1 single door, Chamber xxx-2 double door, ** Parameters of load cart can be modified individually, *** The 300 °C vision is possible only in combination with stainless steel shell of the device.

Model VC IL

* H₁, B₁ available 2000-1, 1500-1 and 700-1
H₂, B₂ available 2000-2, 1500-2 and 700-2



Changes in the desing and make reserved



Ensuring of Customer Services

The user service and support are fully secured by the wide-world net of BMT Medical Technology s.r.o. contract partners. We have a wide net of branded service working places, connected to the HOT-LINE service, which secures the quick reaction on the customer inquiries and requests. For securing of the user comfort and for possibilities of the quick and high-quality service intervention, a special diagnostic

programme was developed. We offer the ON-LINE internet sterilization device diagnostics and monitoring, which offers a quick and direct communication with the device and ensures the continuous, trouble-free operation of the working place. This all grants the low operational costs and the long device lifetime.

VENTICELL IL EASY

The economical hot-air sterilizer variant VENTICELL IL EASY complies with the requirements for installation in clean premises as well. It complies with the requirements of EU Directives 2006/95/EC and 2004/108/EC. The device construction is based on the established and well-proved MMM heat technology devices (COMFORT line) intended for a long-term use in hot-air sterilization and depyrogenation processes with the following necessary technical adjustments:

- sealed chamber and door for installation in clean premises
- separate control panels on both device sides
- ower electronics separated from the basic device body
- reinforced device door for lesser thermal dilatation and better sealing
- settable fixed device legs for stable installation
- adjusted controlling software for the temperature rising time minimization
- sealed exhaust extension and sealed validation port for validation
- varnished or stainless steel covering strips for design fitting of the device into the wall.



Innenvolumen: 404 und 707 Liter
Volume: 404, 707 litres
Working temperature: 10°C above ambient
temperature up to 250°C/300°C
Interior: stainless steel, mat. No. 1.4301 (AISI 304)

Microprocessor Control Unit

- 6 adjustable programs
- chip card system for individual program storage RS 232 – interface for printer or PC communication
- delayed heating start and stop function
- acoustic and visual alarm of error state
- time range 0–40 years with 1 min-intervals
- digital safety thermostat
- real time
- programming temperature ramps
- heating sequences
- programme cycles
- adjustable ventilation rate 10 to 100%
- manual control of the air exhaust flap
- keyboard blocking
- door opening control



Options

- door window and interior lighting
- access ports Ø 25, 50, 100 mm
- door lock
- left door versions
- special software WarmComm 4.0
- HEPA-filter for installation in air inlet
- BMS – potential-free alarm contact
- PT100 sensor
- two-door (passing through) version
- The 300 °C vision is possible only in combination with stainless steel shell of the device.
- stainless steel casing of the device

VENTICELL IL EASY

Technical parametrs

Technical data		Model	404-1 404-2	707-1 707-2
Trays in chamber	Storage area (w x d)	mm	520x485 520x485	920x485 920x485
Trays in loading cart	Storage area (w x d)	mm	490x462 490x487	890x462 890x487
Maximal weight of the load in chamber	Per tray	max. kg	30 30	50 20*
	Over all load	max. kg	100 100	130 130
Door		No.	1 2	2 4
Electricity - mains 50/60 Hz	Nominal voltage	I	3x400+N+PE	3x400+N+PE

Changes in the design and make reserved.



Make acquaintance with our further offers ...

Laboratory drying ovens



ECOCELL

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

DUROCELL

Special- purpose drying ovens DUROCELL with highly resistant EPOLON coating

VACUCELL

Vacuum drying ovens

STERICELL

STERICELL is intended for hot air sterilization of materials under specified temperature and duration.

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.

Laboratory incubators



INCUCELL / INCUCELL V

Suitable for safe treatment of microbiological cultures.

FRIOCELL

Cooling incubators

CLIMACELL

Climatic chambers

CO2CELL

CO₂ atmosphere

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, 148–1 490 l



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