Ovens UIS

Universal ovens U  the all-rounders

Incubators I  the gentle ones

Sterilisers S  the standardised ones
The Memmert world: controlled atmosphere

We set an example in terms of reliability, quality, commitment and innovation.

100% AtmoSAFE is our promise to ensure that all our appliances will have the perfect atmosphere. The absolutely precise control of all parameters, such as temperature, humidity, CO₂-content or pressure guarantees 100% customer benefit.
Innovation – for more than 60 years the formula for our success

Quite small or very large? Easy-use basic specification or individually selected adaptation? Standard application or demanding functionality and documentation facilities?

Drying, incubating, warming, testing, sterilising, ageing, burning-in, testing, curing, storing the wide Memmert model range offers a solution for almost any thermostating task. One thing however is common to all Memmert ovens: an unbeatable price-performance ratio. On these pages you can read why!

Success factor control technology

Irrespective of how unlikely a fault may be, thermal security has the highest priority in the development of Memmert ovens. To mention only one example, even the Basic performance class is already equipped with a high-grade platinum temperature sensor in 4-wire circuit. The other two classes Excellent and Perfect even have two of these independently acting Pt100 sensors. Further safety features are described under Control Technology on pages 14 to 19.

Success factor heating concept

No-one would have the idea to fit the same heating to a wooden hut and to a castle – and that not only for reasons of energy consumption. The heating power of Memmert ovens is adapted to the particular chamber volume and temperature range and optimally controlled electronically. This guarantees a uniform temperature distribution as well as even and gentle heating of sensitive loads. At the same time any temperature overshoot is avoided. Read more about the unique large-area Memmert all-round heating on pages 12 and 13!

Success factor standardisation

All Memmert ovens are developed and produced on the principle of standardisation. Your advantage: excellent quality and functionality throughout, with an outstanding price-performance ratio.

State-of-the-art technology permits rapid machine changeover and flexible fitting of special accessories in current production. In spite of extensively fully-automatic production processes there is enough room to meet your individual requirements.

Using the latest simulation software we optimise all important factors to achieve a uniform temperature distribution in the chamber (here: UFE 400 at +150 °C with two shelves ±1.3 °C)

A glance behind the scenes …

… or how Memmert contributes to the wear and scratch resistance of lenses.

With more than 26 000 employees in thirty-seven countries, the French Essilor Group is the world leader in the manufacture of ophthalmic products. Memmert ovens are used for the surface treatment and thermal curing of lenses.
Ready for unlimited use!

Systematic multiplicity of variants

Take three letters and a number – and you have the required model from among more than sixty possible variants!

- **U or I or S:**
  universal ovens U, incubators I and sterilisers S cover three essential application ranges for thermostating technology

- **N or F:**
  with natural convection or forced air circulation by fan there is a choice of two forms of air circulation

- **B or E or P:**
  three performance classes – Basic, Excellent or Perfect – meet in stages all requirements in thermal security, precision and quality control

- **100 to 800:**
  nine model sizes cover the full variety of load materials and quantities.

Universal ovens U
14 to 749 litre

- **B:** up to +220 °C
- **E/P:** up to +250 °C
  (up to +300 °C at extra charge)
- **N/F:** natural convection or forced air circulation

Incubators I
32 to 749 litre

- **B/E/P:** up to +70 °C
- **N:** natural convection
- **double doors**
  (glass inside, stainless steel outside)
- **STERICard for chamber sterilisation**
  (Perfect class)

Sterilisers
14 to 749 litre

- **B:** up to +220 °C
- **E/P:** up to 250 °C
- **N/F:** natural convection or forced circulation
- **hot air sterilisation at +160 °C to +180 °C and de-pyrogenation at +220 °C**
“In the face of immeasurably rich and continuously regenerating nature, man will always remain the wondering child, however far his scientific knowledge may progress, and must always expect new surprises”,

thus wrote the famous physicist and Nobel Prize winner Max Planck. The obligation to retain this reverence for nature is today more important than ever in research, development and medicine. As it is for us.
For each application
the right oven

Memmert products in their hundred thousands have been in operation for decades in more than hundred-twenty countries. Knowledge and experience over three generations make us worldwide to one of the leading manufacturers of thermostating equipment.

A large number of quality features are found on all our thermostating ovens, from quite small to extra large ones: practice-oriented design, application-suited programming function, as well as unsurpassed precise, uniform and gentle heating of the chamber load. Even during intensive use these high-grade and sturdy stainless steel units loose neither their good appearance nor their reliability.

Incubators I – the gentle ones
32 to 749 litre
up to +70 °C

The world of research, medicine, pharmaceutic-als and food technology would be unthinkable without Memmert incubators. Organic materials demand particularly gentle heating. For this reason both heating and control are specially optimised for low temperatures up to +70 °C. Overshoots are avoided by running up the temperature within a very narrow control band and holding it accurately at the selected setpoint. In accordance with the Medical Products regulation (Directive 93/42/EC) we recommend the incubators INP for warming irrigation and infusion solutions.

In order to minimise the danger of samples drying out, the large-area all-round heating has been so finely balanced that optimal temperature distribution in the chamber is achieved without forced air circulation and using only natural convection. Double doors – glass inside, stainless steel outside – provide a clear view of the load without any danger of temperature drift.

For special applications Memmert offers cooled incubators, CO2 incubators, as well as humidity chambers. Please ask for separate leaflets!

Universal ovens U –
the all-rounders
14 to 749 litre
up to +220 °C (B), up to +250 °C (E+P), up to+300 °C (E+P, extra charge)

The universal units among the ovens cover a range of applications, ideally in temperature ranges from +50 °C. No need for any compromise! With nine model sizes, combined with three controller classes and either natural convection or forced air circulation, there is a thermostating unit combining the latest technology with a high functionality and optimal operating convenience not only for industry but also for science and research.

Model-makers warm up plasticine, developers age computer chips, civil engineers test bitumen. The list of applications of our universal ovens could be extended over many pages.

For each application the precise control technology provides a maximum of security and reliability. In complex test series on highly sensitive materials and with minimal tolerances, this is where the combined action of control, heating and ventilation shows its full effect.

Read more about the Memmert heating and ventilating system on pages 12 and 13, and on control technology from page 14!
**Sterilisers S – the standardised ones**

14 to 749 litre
up to +220 °C (B), up to +250 °C (E/P)

Medicine has to protect and retain life. It is not sufficient to disinfect containers and instruments. A specially convenient feature is the setpoint-dependent programme continuation which ensures that the sterilisation time is accurately maintained (see diagram below, Class E and P only) and even highly resistant micro-organisms are killed completely. Irrespective of the sterilisation load and the chamber volume, this function guarantees the user absolutely reliable sterilisation.

The Memmert hot air sterilisers S conform to all national and international standards and specifications for medical products and are also suitable without restriction for the special application of depyrogenation at +220 °C.

In combination with the User-ID-Card, the process-controlled electromagnetic door lock (options, extra charge) on the Perfect class represents the ultimate in regard to security.

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**Setpoint-Wait function**

Exactly timed temperature control helps to save life (e.g., in sterilisation). For this reason the Setpoint-Wait function on Class E and P ensures that the programme continues only after the setpoint has been reached.

When measuring using the additional, freely positioned Pt100 sensors (option Class P only) the reaching of the set temperature in the load is decisive for the continuation of the programme. This also ensures absolutely reliable depyrogenation. Up to three measurements can be indicated directly on the oven or a measurement can be output to an external instrument.

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**A glance behind the scenes …**

… or why Memmert can claim to have played a minute part in an important pioneering achievement.

In December 1967 the South-African surgeon Christiaan Barnard successfully performed an operation which no man had previously survived: the transplantation of a human heart. Dr. Barnard was supported by a large team of assistants, as well as technical equipment which was state-of-the-art at the time. Right among all the equipment at the Groote Schuur hospital in Capetown was a Memmert oven – thousands of miles away from the Company headquarters in South Germany and 20 years after the production of the first Memmert hot air steriliser.
Each little detail brings measurable advantages

Good design is identified not only through high-grade materials and clear shape. Equally important are criteria such as ergonomics, long life and operating convenience. Excellent design also achieves the ultimate goal: it combines many small functional details into an overall result.

Convenience made for you!

A uniform concept for all ovens:
- Clear, easy-to-clean underglass functional display for visualising all process parameters
- Unique to Memmert: the patented push/turn control for the intuitive operation of the entire menu
- Chamber easy to clean, no inaccessible spaces and corners
- Strong, fully insulated stainless steel door (inner face thermally decoupled from the external body)
- When both hands are full: convenient closing of the door by pressing on the door handle with the elbow
- Calibration and appropriate adjustment directly on the oven of Class E and P.

Stainless steel – the noble material

Memmert ovens can be found in the microbiology laboratory just as much as in material testing for industrial manufacture. Wherever they are, they demonstrate the superiority of high-grade stainless steel over painted sheet steel which soon tends to corrode during extended use. The structured stainless steel of the outer case (back panel in zinc-plated sheet steel) has for many years been the unmistakable mark and expression of the Memmert’s holistic quality philosophy. Functional design in its most beautiful form: scratch-resistant, sturdy and durable.

The chamber interior is made entirely from high-grade and fully recyclable stainless steel Mat.Ref. 1.4301 (ASTM 304). Specially smooth and hygienic surfaces simplify cleaning without leaving any residue.
Factory calibration

Simple navigation through the latest technology

On all Memmert ovens the push/turn control forms the simple centrepiece for menu navigation and operation. On the highest class controllers it is possible to preset on the oven, among others, temperature setpoints, fan speed, air flap setting, over- and undertemperature protection, ON and OFF times, weekdays, multi-week running times and up to 40 temperature ramps.

The underglass functional display shows at all times and at a glance the entire programme: temperature, operating mode, heating, ventilation and air flap status, time and alarm signals.

These doors are completely tight

Many small features of Memmert ovens help to avoid the time-consuming and energy-wasting readjustment of the temperature. A good example for smart design is the ingenious door construction on all ovens. As the door is closed it is barred at the top and bottom and at the same time pressed against the oven body. The hot internal faces of the door are thermally decoupled by seals against the outside.

Fine adjustment à la carte

The utmost precision of control where it is required! Many heating processes, especially in medicine or pharmaceuticals, demand maximum precision over the entire temperature range with defined chamber loads. Ovens of Class E and P offer the facility to adjust the control by means of up to three freely selected measuring points and in this way to adapt it accurately to the special application.

Three freely selected calibration temperatures CAL1 to CAL3, adjustable directly on Class E and P units
Perfect energy performance by Memmert

Temperature control is the heart of every oven – you might think. Memmert presents a different approach. All essential components such as control, heating and ventilation are seen as a unit and are further developed in-house. It is only through the ideal interplay of technology that the material in the chamber can be heated gently and yet speedily and uniformly.

The use of large-area all-round heating ensures particularly gentle thermal treatment. By distributing the heating power over a large number of heating elements it is barely subject to wear and has therefore an extremely long life.

At a glance

The unbeatable advantages of the Memmert heating and ventilating system:

- The heating elements are protected and yet are close to the chamber load
- No corrosion or deposits on the heating elements
- The direct contact between heating ribs and sliding shelves ensures excellent heat transfer and therefore improved temperature distribution
- The positioning of the heating elements around the chamber leads to optimal temperature uniformity, even with large chamber loads
- The excellent thermal conductivity of the aluminium thermostating jacket mounted on the outside of the chamber interior additionally optimises temperature uniformity and heat accumulation (e.g. during a power failure)

Without imitation: the heating concept

Very extensive manufacturing expertise and outstanding material know-how are behind the unique Memmert heating system which has been improved over decades. The working chambers in stainless steel with hairpin-shaped ribs are deep-drawn on fully automatic manufacturing plants. The ribs serve for accommodating the heating elements behind the four inner walls of the chamber thus being well protected from any damage.

This decentralised arrangement of the heating ensures uniform temperature distribution inside the chamber even with reduced chamber air circulation due to large chamber loads, or with the fan-driven air circulation switched off.

Heating and control, a strong team

Full power ahead! Not with Memmert. Apart from an increased energy consumption, the consequences of temperature overshoots might be fatal for sensitive loads. The strict requirements of quality assurance demand a form of control which is accurately adapted to different chamber volumes, chamber loads and temperature ranges.

To reach the setpoint rapidly and directly and yet heat uniformly and gently – in combination our technology concepts for heating and control as developed in-house are unbeatable.

A glance behind the scenes ...

... or how Memmert contributes to the development of safety components for the motorcar.

Leoni AG, a company with its head office in Nuremberg, Germany, is a worldwide supplier of wire, cable, and on-board systems. Cable are aged for many months in Memmert ovens in order to simulate long-term material changes under real conditions.
**Fresh air is pre-warmed**

Temperature drift? Not with Memmert! On all Memmert ovens the fresh air is heated in a pre-warming chamber and continuously added to the air inside the chamber.

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**Ventilation, the third element**

A carefully designed ventilation concept supplements the technology package in Memmert ovens. For optimal temperature distribution inside the chamber we offer for universal ovens and sterilisers a fan-driven air circulation which can be controlled in 10% steps on Class E and P ovens as well as switched off. Your advantage? The proper adjustment of the air circulation avoids undesirable air movements, especially when drying powder, sand, grain or cosmetics. The fan speed can be reduced in the process as the dryness of the material increases.
Modern control technology in three performance classes

To be close to the user, to seek continuous interchange – that too is one of the secrets of our success. Only in this way can we perfectly adapt operation, functionality and security of our three performance classes to your requirements, and it is for the same reason that we develop and manufacture all controllers in-house.

Three stages – innumerable applications

The controller is the switching centre in the Memmert oven. Every single one, without exception, passes a thorough test procedure before installation, and in addition is calibrated before the oven is shipped. Zero error and hundred percent customer satisfaction – development and production have to meet high standards in the optimisation of our three controller classes.

<table>
<thead>
<tr>
<th>Basic</th>
<th>Reliable and precise for standard applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Application multiplicity par excellence</td>
</tr>
<tr>
<td>Perfect</td>
<td>In regard to convenience and documentation</td>
</tr>
</tbody>
</table>

A high standard right from the start

Modern technology maintains the temperature in the green range.

- Double temperature monitor, with relay switch-off when the setpoint has been exceeded by a defined amount, as well as mechanical temperature limiter TB to switch off the oven heating above the maximal temperature
- For optimal and long-term transmission of the temperature signal: a platinum temperature sensor Pt100 (Class A) in high-grade 4-wire circuit

Fan runs on for 30 minutes: shorter cooling-down times, no hot spots, more security

Double security through monitor relay and mechanical temperature limiter TB
Basic – reliable and precise for standard applications

In this controller class the functionality is concentrated on thermal accuracy and security. High-grade components and materials are also standard for this class. Basic is ideal for drying or warming of less sensitive materials at a single pre-selected setpoint.

- Manually adjustable air flap for fresh air supply
- Visual alarm on overtemperature
- Simultaneous indication of residual operating time and temperature

Timer module
1 Time indication (here residual running time)

Operation mode
2 Normal operation
3 Timer operation (active)
   Programming a hold time up to to 99:59 hours
4 SET key
5 Push/turn control
6 Air flap

Temperature module
7 Heating indicator
8 Setpoint/actual temperature
- temperature range:
  without fan 5 °C above ambient,
  with fan 10 °C
  up to +220 °C (U/S)
  up to +70 °C (I)
- Temperature variation (time):
  ≤ ±0,5 °C at 150 °C (U/S)
  ≤ ±0,2 °C at 37 °C (I)

Monitor module
9 Visual alarm on overtemperature and other error messages
Excellent – application multiplicity par excellence

Recommended for applications which make high demands on thermal security, the Excellent Class offers a wide range of programming and documentation facilities.

Convenience and precision? Excellent!

User-friendly and manifold:

- Multifunctional fuzzy-supported control for exact setting and maintenance of the setpoint temperature
- 2 high-grade platinum temperature sensors Pt100 in 4-wire circuit for long-term stability of temperature signal transmission, with mutual monitoring and function transfer on sensor fault in order to maintain the set temperature
- Setpoint Wait: the next programme step starts only after the setpoint required is reached
- Calibration facility for temperature directly on the controller (see diagram page 11)
- Optional (extra charge): Pt100 sensors flexibly positioned inside the chamber, for external temperature recording
- Manually adjustable air flap for fresh air supply
- Fan speed adjustable in 10% steps and shut-off

EXCELLENT programme operation:
Unlimited repeats of identical processes through combined weekday and repeat function loop

EXCELLENT weekly timer:
Daily repeating processes with identical parameters

EXCELLENT temperature monitor:
Triple security through relay switch-off on exceeding the setpoint, mechanical temperature limiter TB and adjustable electronic temperature monitor TWW with freely selected setpoint

Triple is better!
Technology for thermal security:

- Integrated auto-diagnostic system with visual fault indication
- Triple protection for sensitive loads (see diagram temperature monitor): the setpoint of the adjustable electronic temperature monitor TWW can be freely selected to suit the application and material
- Heating switched off and visual fault indication on overtemperature

Lost data? Impossible!
The basic outfit for professional quality assurance:

- “Celsius” standard software for programming and documentation
- Internal flash memory for gap-free long-term documentation (approx. 6 months) protected against manipulation
- RS232 interface for programming and storage of temperature processes; USB option at extra charge
### Control panel Excellent

**Timer module**
1. Time display (here real-time)

**Operating mode**
2. Normal operation (active)
3. Weekly timer*
4. Ramp timer (relative-time programme)
5. Configuration
6. Wait (at programme start)
7. Heating ramp
8. Setpoint Wait – programme continues when setpoint is reached
9. Hold ramp
10. Cooling ramp
11. Edit (ramp timer)
12. Repeat function

*Weekly timer, programmable with one ON and OFF period per weekday; additional group function (e.g. Mo-Fr)

13. Stop (ramp timer)
14. Start (ramp timer)
15. SET key
16. Push/turn control
17. Air flap

**Temperature module**
18. Heat function indication
19. Setpoint/actual temperature
20. Fan speed in 10% steps

- Temperature range:
  - without fan: 5 °C above ambient,
  - with fan: 10 °C
  - up to +250 °C (U/S)
  - up to +300 °C (U extra charge)
  - up to +70 °C (I)

- Temperature variation (time):
  - ±0.25 °C at 150 °C (U/S)
  - ±0.05 °C at 37 °C (I)

**Monitor module**
21. Visual alarm (on overtemperature and other error messages)
22. Alarm limit (heating switch-off temperature)
23. Temperature monitor
24. High alarm limit
Perfect – in regard to convenience and documentation

In thermal security and operating convenience this most advanced Memmert controller class is perfect without any compromise. Complex thermal processes are programmed with ease and can be repeated indefinitely if required, using the MEMoryCard. A multi-functional fuzzy-supported PID process controller with permanent power adaptation and integrated auto-diagnostic system ensures perfect and absolutely reliable heating.

Security: of course!

Still more functions for zero error:

- Protection against operation by unauthorised persons: optional oven-related personal User-ID-Card (extra charge)
- Multiple temperature monitor with relay switch-off on defined exceeding of the setpoint, mechanical temperature limiter TB, and electronic adjustable temperature monitor TWW
- Unique security feature “Automatic Safety Function” ASF: integral over- and undertemperature monitor which automatically shadows the setpoint within a freely selectable tolerance band
- Integrated auto-diagnostic system with visual and audible error indication
- Visual and audible signal on over/undertemperature

Documentation: for controlled quality

The easy-use specification for professional quality control:

- “Celsius” standard software for programming and documentation, also (option at extra charge) FDA-conforming software
- Internal flash memory for continuous (approx. 6 months) documentation protected against manipulation
- MEMoryCard XL for programming up to 40 temperature ramps as well as for documenting the temperature profiles
- Parallel printer interface / USB (extra charge) via converter
- Alternative interfaces for programming, storage and documentation available

RS232 RS485 USB* Ethernet*

*extra charge

Perfect multi-functionality during ramp operation: temperature (can also be programmed depending on setpoint), fan speed and air flap position can be selected for each segment

The perfect Memmert monitoring system guarantees multiple security for chamber load, oven and the environment
**Precision:**
**for controlled processes**

Technical features for fault-free processes:
- **Multifunctional fuzzy-supported control** for accurately setting and maintaining the setpoint temperature.
- **The controller regulates individual heating groups to achieve optimum temperature uniformity.**

- **2 high-grade platinum temperature sensors Pt100 in 4-wire circuit (for long-term stability of measurement signal transmission) with mutual monitoring and function transfer at equal working temperature (see diagram page 16 left).**
- **Setpoint Wait:** the next programme step starts only after the setpoint required is reached.
- **Fan speed can be controlled in 10% steps and switched-off.**
- **Air flap opening can be adjusted in 10% steps.**
- **Calibration facility for temperature directly on the controller (see diagram page 11).**
- **Option (extra charge): Pt100 sensors positioned flexibly inside the chamber or in the load, for temperature documentation through flash memory.**
- **Manual zone-dependent heating power adjustment available in setup.**

### Timer module
1. Time display (here real-time)
2. Text messages

### Operating mode
3. Normal operation (active)
4. Weekly timer
5. Ramp timer (relative-time programme)
6. Printer
7. Configuration
8. Wait (at programme start) Hold (during programme run)
9. Heating ramp
10. Setpoint Wait – programme continues when setpoint is reached
11. Hold ramp

* Weekly timer, programmable with one ON and OFF period per weekday; additional group function (e.g. Mo-Fr)

12. Cooling ramp
13. Sounder after ramp timer end
14. Repeat function
15. Edit (ramp timer)
16. Stop (ramp timer)
17. Start (ramp timer)
18. Data manipulation prevented by optional User-ID-Card (extra charge)
19. SET key
20. Push/turn control

### Control panel Perfect

### Temperature module
22. Heat function indication
23. Setpoint/actual temp.
24. Fan speed
25. Air flap opening

### Monitor module
26. Visual alarm
27. Alarm limit (heating switch-off temperature)
28. Temperature monitor
29. Low alarm limit
30. Automatic alarm limit (ASF)
31. High alarm limit
32. Sounder on alarm

Audible and visual alarm on over/undertemperature and other error messages.

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**Temperature range:**
- Without fan: 5 °C above ambient, with fan: 10 °C up to +250 °C (**U/S**), up to +300 °C (**U extra charge**), up to +70 °C (**I**).
- Temperature variation (time):
  - ±0.25 °C at 150 °C (**U/S**)  
  - ±0.05 °C at 37 °C (**I**).

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**Air flaps opening can be adjusted in 10% steps.**

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**Calibration facility for temperature directly on the controller (see diagram page 11).**

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**Option (extra charge): Pt100 sensors positioned flexibly inside the chamber or in the load, for temperature documentation through flash memory.**

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**Manual zone-dependent heating power adjustment available in setup.**
Programming and documentation for controlled quality

Documentation storage, software and RS232 interface are already standard on Class E. Memmert appliances conform in their specification to the requirements of GMP/GLP as demanded e.g. in medicine, pharmaceuticals and the food industry. Internal long-term log memory, "Celsius" remote control and documentation software, interfaces for programming, storage and printing of thermal processes and a MEMoryCard for programming and documentation are included in all ovens with the highest controller class Perfect.

"Celsius" for remote programming and reading of the log memory

All models Class E and P include as standard a serial computer interface RS232 as well as the operating software "Celsius". Quality assurance with excellent operating convenience:

- Graphic and numerical programming of temperature profiles with an unrestricted number of ramps
- Ramp-dependent programming of fan speed and air flap setting (depending on oven type)
- With RS232, control of up to eight ovens; optional USB at extra charge
- On Class P with optional RS485, control of up to 16 ovens; Ethernet incl. Software "Ethernet Edition" (option at extra charge)
- Any combination of Memmert units with serial interface since 1996
- Selection of four languages: English, Spanish, French, German
- Storage and printing of thermal processes with the corresponding process data (in accordance with Good Laboratory Practice GLP and Good Manufacturing Practice GMP)

Parallel printer interface for local documentation

Class P ovens have a parallel printer interface for direct connection of a PLC3-compatible ink jet printer

- Graphic print of the internal logging files over a selected time span (see diagram below)
- Numerical print of the currently programmed thermal process
- Logging files in the controller are retained, therefore no data loss on printer outage
- Converter cable (parallel to USB) for connection of printers with USB interface as accessory (extra charge)

Flash memory for up to 6 months data documentation

The ovens Class E and P incorporate a 1042 kB flash ring memory. It stores all adjustable parameters such as e.g. temperature, air flap, fan, temperature monitor, as well as the measured actual temperatures and error states, every minute over a period of up to 6 months (in 24 h operation) with exact identification of test time and date.

Flash ring memory: print data directly from oven without PC
Fit for TQM and user audits

Oven qualification within the framework of quality management or validation processes is in a large number of organisations an essential prerequisite in the choice of a supplier. In addition to the works calibration certificate which is supplied as standard for the Excellent and Perfect class, Memmert supplies on demand the necessary IQ and OQ documentation to support user certification (extra charge).

Documentation software according to FDA guidance on 21 CFR Part 11

The FDA edition of the “Celsius” software is available on all models of Class P at extra charge. Within a closed system it meets the following regulations and requirements for the electronic generation and storage of production and quality assurance documents (Electronic Records):

- User administration in user groups through the administrator
- User and administrator of Electronic Records are uniquely identified and authentic
- User-related access protection for individual system functions
- Storage of profile and logging files in a file format protected against manipulation
- All changes are documented long-term over the archiving period
- Log-on and log-off processes as well as changes of raw data are programmed with anti-manipulation protection with the aid of an audit trail (time stamp, signature and type of change of Electronic Record)
- The electronic signature indivisibly linked to the Electronic Record ensures that the responsible originator is uniquely identified
- Complete integration into the Windows NT, Windows 2000 and XP Professional security system (authorisation administration, user and password administration)
- Facility for exporting data of the audit trail in generally readable HTML
- Facility for data access by inspectors of the supervisory authorities

MEMoryCard XL

More time for essentials! The oven can store on the MEMoryCard a temperature profile file with up to 40 ramps which can then be repeated indefinitely. During the programme run the actual values are automatically stored on the card and can be visualised and archived in a data processing system via the oven interface or through an external card reader.

STERICard

Incubators of Perfect class INP are supplied with a STERICard. It guarantees reliable and fully automatic sterilisation of the chamber in four hours at 160°C. For safety reason this function can only be started through the STERICard and serves not for sterilising the load but exclusively for sterilising the chamber interior. During the sterilising process the menu operation on the oven is blocked so that there is no possibility of inadvertently changing the programme.

User-ID-Card

Each User-ID-Card (extra charge) is unique and linked through 128-bit encryption to the oven serial number and an individual personal identification number, thus preventing undesirable manipulation on the controller by third persons. Every use of a User-ID-Card is documented in the internal flash memory. Parameters can be altered only after inserting the User-ID-Card into the card reader. When an oven is used by several persons it is of course possible for every user to obtain his own User-ID-Card.

Fit for TQM and user audits

Oven qualification within the framework of quality management or validation processes is in a large number of organisations an essential prerequisite in the choice of a supplier. In addition to the works calibration certificate which is supplied as standard for the Excellent and Perfect class, Memmert supplies on demand the necessary IQ and OQ documentation to support user certification (extra charge).
Glossary

**Actual temperature:** actually measured temperature as reached so far

**Ageing:** to accelerate the ageing process by thermal treatment

**ASF:** Automatic Safety Function – automatically the setpoint shadowing monitoring band

**Cooling time (cooling ramp):** The time required until the chamber temperature has cooled down from the hold ramp temperature to ambient temperature or where appropriate to a higher removal temperature. The cooling time can be shortened by opening the air flap to its maximum extent, if desired. The cooling process can be intentionally lengthened by suitably programming the controller (Note: ovens series U/S do not have a cooling unit)

**Ethernet:** standardised interface for cable networks

**FDA:** Food and Drug Administration - USA body which among others lays down strict regulations for the programming and documentation of thermal processes

**Fuzzy-supported PID process controller:** control system with simultaneous proportional, integral and differential action and which additionally takes into account non-linear components. This controller type is capable of adapting automatically to varying effects such as changes in fan speed, air flap position, or the amount of load, and to counteract directly any deviation

**IQ Installation Qualification:** documented proof that the specification of a product meets the actual requirements with regard to identity, installation, conformity to guidelines and documentation. It is performed after the product is supplied and in parallel with the installation

**Load:** material, product, container with material or similar which is placed inside the oven (the quantity affects the heating-up time)

**Monitor relay:** electromechanical safety device to switch off the heating at a fixed distance of 10 °C (Series U/S) or 3 °C (Series I) above the setpoint if the electronic heating control fails.

**MPG:** Law on medical products

**OQ Operation Qualification:** documented proof that, after installation and/or calibration, the prescribed specification has been maintained within a representative working range (e.g. temperature range)

**Overshoot:** undesirable rise of the actual temperature above the setpoint

**PQ Process Qualification:** documented proof that a product or process meets the expectations under manufacturing conditions which correspond to the specification and the required quality assurance parameters

**Pt100 in 4-wire circuit:** platinum temperature sensor in 4-wire circuit ensures stable long-term transmission of measurement signals

**Ramp:** constantly rising, holding or falling temperature

**RS232:** interface for serial data transmission over short distances

**RS485:** interface for serial data transmission (over longer distances, bus-capability)

**Setpoint:** currently set and desired value

**Setpoint Wait:** the next ramp starts only when the temperature setpoint required has been reached

**TB:** temperature limiter, thermal safety class 1 (DIN 12 880:2007-05) for permanently switching off the heating when the maximum permitted oven temperature is exceeded by approx. 10 °C

**Temperature profile:** usually a temperature sequence consisting of one or several ramps

**Temperature uniformity:** temperature variation in space, i.e. the maximum temperature difference between two or more measuring points inside the oven chamber at a particular time

**Temperature variation:** in time, i.e. the maximum temperature difference at a previously selected measuring point inside the oven chamber at different times

**TQM:** total quality management

**TWB:** adjustable temperature limiter, thermal safety class 2 (DIN 12 880:2007-05): switches off the heating permanently when a pre-selected monitoring temperature has been exceeded

**TWW:** adjustable temperature monitor, thermal safety class 3.1 (DIN 12 880:2007-05): the thermal process is continued at the pre-selected monitor temperature

**USB:** universal serial bus, standardised PC interface

**Validation:** proof that the processes, equipment, materials, work procedures or system actually lead to the expected results

**VDE test mark:** safety mark issued by the VDE test institute

**Heating-up time:** time required until the actual temperature is continuously maintained at the setpoint within a small tolerance

**IQ Installation Qualification:** documented proof that the specification of a product meets the actual requirements with regard to identity, installation, conformity to guidelines and documentation. It is performed after the product is supplied and in parallel with the installation

**Load:** material, product, container with material or similar which is placed inside the oven (the quantity affects the heating-up time)

**Monitor relay:** electromechanical safety device to switch off the heating at a fixed distance of 10 °C (Series U/S) or 3 °C (Series I) above the setpoint if the electronic heating control fails.

**MPG:** Law on medical products

**OQ Operation Qualification:** documented proof that, after installation and/or calibration, the prescribed specification has been maintained within a representative working range (e.g. temperature range)

**Overshoot:** undesirable rise of the actual temperature above the setpoint

**PQ Process Qualification:** documented proof that a product or process meets the expectations under manufacturing conditions which correspond to the specification and the required quality assurance parameters

**Pt100 in 4-wire circuit:** platinum temperature sensor in 4-wire circuit ensures stable long-term transmission of measurement signals

**Ramp:** constantly rising, holding or falling temperature

**RS232:** interface for serial data transmission over short distances

**RS485:** interface for serial data transmission (over longer distances, bus-capability)

**Setpoint:** currently set and desired value

**Setpoint Wait:** the next ramp starts only when the temperature setpoint required has been reached

**TB:** temperature limiter, thermal safety class 1 (DIN 12 880:2007-05) for permanently switching off the heating when the maximum permitted oven temperature is exceeded by approx. 10 °C

**Temperature profile:** usually a temperature sequence consisting of one or several ramps

**Temperature uniformity:** temperature variation in space, i.e. the maximum temperature difference between two or more measuring points inside the oven chamber at a particular time

**Temperature variation:** in time, i.e. the maximum temperature difference at a previously selected measuring point inside the oven chamber at different times

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**VDE test mark:** safety mark issued by the VDE test institute

**Heating-up time:** time required until the actual temperature is continuously maintained at the setpoint within a small tolerance
Technical data, models and accessories for Ovens (Universal Ovens, Incubators, Sterilisers)

according to DIN 12880: 2007-05, 50 011, 58 947, EN 61010-1 (IEC 61010-1), 61010-2-010 and 61010-1-043

Note:
Size 600-800 with two-leaf doors

Dimensions of Ovens
(see table below)

* on models with fan depth is reduced through air duct in the middle of back wall up to size 600: 30 mm; size 700/800: 45 mm

<table>
<thead>
<tr>
<th>Model sizes</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>700</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel interior, mat. 1.4301 (ASTM 304), deep-drawn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>approx. l</td>
<td>14</td>
<td>32</td>
<td>39</td>
<td>53</td>
<td>108</td>
<td>153</td>
<td>256</td>
<td>416</td>
</tr>
<tr>
<td>Width (see sketches above)</td>
<td>mm</td>
<td>320</td>
<td>400</td>
<td>480</td>
<td>400</td>
<td>560</td>
<td>480</td>
<td>800</td>
<td>1040</td>
</tr>
<tr>
<td>Height (see sketches above)</td>
<td>mm</td>
<td>240</td>
<td>320</td>
<td>320</td>
<td>400</td>
<td>480</td>
<td>640</td>
<td>640</td>
<td>800</td>
</tr>
<tr>
<td>Depth (see sketches above)</td>
<td>mm</td>
<td>175</td>
<td>250</td>
<td>250</td>
<td>330</td>
<td>400</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Provision for sliding stainless steel shelves or wire grid shelves</td>
<td>number</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Max. loading per perforated stainless steel shelf (basic equipment)</td>
<td>kg</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Max. total loading of chamber (basic equipment)</td>
<td>kg</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>90</td>
<td>60</td>
<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>

Stainless steel exterior (rear zinc-plated steel)

| Width | mm | 470 | 550 | 630 | 550 | 710 | 630 | 950 | 1190 | 1190 |
| Height (size 800 with castors) | mm | 520 | 600 | 600 | 680 | 760 | 920 | 920 | 1080 | 1620 |
| Depth (without door handle, door handle 38 mm) | mm | 325 | 400 | 400 | 480 | 550 | 650 | 650 | 750 | 750 |

Further data

| Electrical load (during heating) | series U/S | approx. W | 600 | 1100 | 1200 | 1400 | 2000 | 2200 | 2400 | 4800 |
| Electrical supply 230 V (+10%), 50/60 Hz | series U/S | approx. V | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 |
| Other voltages to special order | series U/S | approx. V | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 |
| Net weight | approx. kg | 20 | 28 | 30 | 35 | 50 | 82 | 87 | 121 | 170 |
| Gross weight in frigcarton | ca. kg | 25 | 34 | 38 | 42 | 63 | 114 | 105 | 145 | 230 |
| Packed dimensions (carton) | width | approx. cm | 58 | 67 | 75 | 67 | 82 | 75 | 110 | 134 |
| height | approx. cm | 62 | 70 | 70 | 78 | 97 | 114 | 114 | 131 | 184 |
| depth | approx. cm | 44 | 54 | 54 | 63 | 67 | 84 | 85 | 85 | 91 |

Standard accessories

| Stainless steel grids | number | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| Wire grid shelf width (shelves to order) | approx. mm | 317 | 397 | 477 | 397 | 557 | 477 | 797 | 1037 | 1037 |
| Wire grid shelf depth | approx. mm | 160 | 235 | 235 | 290 | 360 | 460 | 460 | 450 | 550 |

Models

<table>
<thead>
<tr>
<th>Universal Ovens (series U)</th>
<th>Incubators (series I)</th>
<th>Sterilisers (series S)</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>700</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic (Class B)</td>
<td>UNB</td>
<td>natural air circulation</td>
<td>UNB</td>
<td>100</td>
<td>UNB</td>
<td>200</td>
<td>UNB</td>
<td>300</td>
<td>UNB</td>
<td>400</td>
<td>UNB</td>
</tr>
<tr>
<td>UFB</td>
<td>enforced air circulation</td>
<td>UFB</td>
<td>400</td>
<td>UFB</td>
<td>500</td>
<td>UFB</td>
<td>600</td>
<td>UFB</td>
<td>700</td>
<td>UFB</td>
<td>800</td>
</tr>
<tr>
<td>INB</td>
<td>natural air circulation</td>
<td>INB</td>
<td>200</td>
<td>INB</td>
<td>300</td>
<td>INB</td>
<td>400</td>
<td>INB</td>
<td>500</td>
<td>INB</td>
<td>600</td>
</tr>
<tr>
<td>SNB</td>
<td>natural air circulation</td>
<td>SNB</td>
<td>100</td>
<td>SNB</td>
<td>200</td>
<td>SNB</td>
<td>300</td>
<td>SNB</td>
<td>400</td>
<td>SNB</td>
<td>500</td>
</tr>
<tr>
<td>SFB</td>
<td>enforced air circulation</td>
<td>SFB</td>
<td>400</td>
<td>SFB</td>
<td>500</td>
<td>SFB</td>
<td>600</td>
<td>SFB</td>
<td>700</td>
<td>SFB</td>
<td>800</td>
</tr>
<tr>
<td>Excellent (Class E)</td>
<td>UNE</td>
<td>natural air circulation</td>
<td>UNE</td>
<td>200</td>
<td>UNE</td>
<td>300</td>
<td>UNE</td>
<td>400</td>
<td>UNE</td>
<td>500</td>
<td>UNE</td>
</tr>
<tr>
<td>UFE</td>
<td>enforced air circulation</td>
<td>UFE</td>
<td>400</td>
<td>UFE</td>
<td>500</td>
<td>UFE</td>
<td>600</td>
<td>UFE</td>
<td>700</td>
<td>UFE</td>
<td>800</td>
</tr>
<tr>
<td>INE</td>
<td>natural air circulation</td>
<td>INE</td>
<td>200</td>
<td>INE</td>
<td>300</td>
<td>INE</td>
<td>400</td>
<td>INE</td>
<td>500</td>
<td>INE</td>
<td>600</td>
</tr>
<tr>
<td>SNE</td>
<td>natural air circulation</td>
<td>SNE</td>
<td>200</td>
<td>SNE</td>
<td>300</td>
<td>SNE</td>
<td>400</td>
<td>SNE</td>
<td>500</td>
<td>SNE</td>
<td>600</td>
</tr>
<tr>
<td>SFE</td>
<td>enforced air circulation</td>
<td>SFE</td>
<td>400</td>
<td>SFE</td>
<td>500</td>
<td>SFE</td>
<td>600</td>
<td>SFE</td>
<td>700</td>
<td>SFE</td>
<td>800</td>
</tr>
<tr>
<td>Perfect (Class P)</td>
<td>UNP</td>
<td>natural air circulation</td>
<td>UNP</td>
<td>200</td>
<td>UNP</td>
<td>300</td>
<td>UNP</td>
<td>400</td>
<td>UNP</td>
<td>500</td>
<td>UNP</td>
</tr>
<tr>
<td>UFP</td>
<td>enforced air circulation</td>
<td>UFP</td>
<td>400</td>
<td>UFP</td>
<td>500</td>
<td>UFP</td>
<td>600</td>
<td>UFP</td>
<td>700</td>
<td>UFP</td>
<td>800</td>
</tr>
<tr>
<td>INP</td>
<td>natural air circulation</td>
<td>INP</td>
<td>200</td>
<td>INP</td>
<td>300</td>
<td>INP</td>
<td>400</td>
<td>INP</td>
<td>500</td>
<td>INP</td>
<td>600</td>
</tr>
<tr>
<td>SFP</td>
<td>enforced air circulation</td>
<td>SFP</td>
<td>400</td>
<td>SFP</td>
<td>500</td>
<td>SFP</td>
<td>600</td>
<td>SFP</td>
<td>700</td>
<td>SFP</td>
<td>800</td>
</tr>
</tbody>
</table>

Electrical supply 230 V (±10%), 50/60 Hz

Other voltages to special order
### Performance Classes

<table>
<thead>
<tr>
<th>Operation</th>
<th>Basic</th>
<th>Excellent</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main switch push/turn control for switching on/off resp. (in combination with SET button) setting of parameters</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Function signal for standby/operating mode</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Visualisation / digital display of all temperature and time settings</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Visualisation / digital display of all weekday, speed, ramp segment and setup settings</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Menu guidance via 8-digit alphanumeric display</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Temperature

- Electronic microprocessor temperature controller with auto-diagnostic system: ☐
- Electronic multifunction temperature controller with Fuzzy-Logic auto-diagnostic system: ☐
- One temperature sensor Pt100 Class A in 4-wire circuit with warning indication on failure: ☐
- Two temperature sensors Pt100 Class A in 4-wire circuit for uninterrupted operation on failure of one Pt100 with warning indication: ☐

<table>
<thead>
<tr>
<th>Temperature Setting Range</th>
<th>Basic</th>
<th>Excellent</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series US</td>
<td>from +20 °C up to +220 °C</td>
<td>from +20 °C up to +250 °C (U: option up to +300 °C)</td>
<td>from +20 °C up to +250 °C (U: option up to +300 °C)</td>
</tr>
<tr>
<td>Series I</td>
<td>from +20 °C up to +70 °C</td>
<td>from +20 °C up to +70 °C</td>
<td>from +20 °C up to +70 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indication Accuracy</th>
<th>Basic</th>
<th>Excellent</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series US</td>
<td>0,1 °C / 0,5 °C</td>
<td>0,1 °C / 0,5 °C</td>
<td>0,1 °C / 0,5 °C</td>
</tr>
<tr>
<td>Series I</td>
<td>0,05 °C / 0,2 °C</td>
<td>0,05 °C / 0,2 °C</td>
<td>0,05 °C / 0,2 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting Accuracy</th>
<th>Basic</th>
<th>Excellent</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series US</td>
<td>0,1 °C</td>
<td>0,1 °C</td>
<td>0,1 °C</td>
</tr>
<tr>
<td>Series I</td>
<td>0,05 °C</td>
<td>0,05 °C</td>
<td>0,05 °C</td>
</tr>
</tbody>
</table>

### Monitor

- Mechanical temperature limiter (TB) for permanent heating switch-off: ☐
- Heating switch-off at a fixed margin of 10 °C (Series US) or 3 °C (Series I) above setpoint on failure of electronic heating control: ☐
- Microprocessor temperature monitor acting as overtemperature protection, with Pt100 incorporating fault diagnostics: ☐
- Microprocessor temperature monitor acting as overtemperature protection and undertemperature alarm, with Pt100 incorporating fault diagnostics: ☐
- Temperature monitoring band automatically linked to the setpoint (ASF): ☐
- Visual / acoustic alarm: ☐

### Air Circulation

- Air flap for admixture of fresh air, manually adjustable: ☐
- Air flap for admixture of fresh air, segmentspecific adjustable by servomotor: ☐
- Fan speed adjustable (for Class P segmentspecific): ☐
- 0-100% in 10%-steps (for UF/SF): ☐

### Timer-funcions

- Real-time/weekly programmer with group function (e.g. Monday-Friday): ☐
- Integral digital switch off-timer (1 min. up to 99 h 59 min.) to switch off heating after preset operating time: ☐
- Timer with residual running time: max. 4 ramps (each 1 min. up to 999 h) programmable through controller: delayed on, heating up, hold or hold set-temperature-dependent and defined cooling down; programming via PC and free-of-charge software: unlimited number of ramps: ☐
- Chip card control: entering settings and temperature documentation up to 40 ramps, 1 chip card MEMoryCard XL with 32 kB memory capacity: ☐
- Sterilisation of incubator-interior by additional chip card (STERICard) with fixed cycle of 4 h/160 °C (series I): ☐
- Repeat function (Loop: 1-99 times / endless): ☐

### Documentation

- Internal log memory 1024 kB as ring memory for all setpoints, actual values, errors, settings with real-time and date, capacity approx. 6 months at 1 min. intervals: ☐
- Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories): ☐
- "Celsius"2) Software for control and documentation of temperature, air flap opening (Class P) and fan speed (for UF/SF): ☐

### Setup

- Calibration (no separate PC required): ☐
- Temperature: 3-point calibration on controller: ☐
- Setting of language for dialogue and display D / UK / E / F / I: ☐

---

1) 0,1 °C up to 99,9 °C; 0,5 °C above 100 °C
2) MEMMERT-Software "Celsius" has been linked for Windows NT 4, 2000, XP and Vista

Subject to technical modifications

- Standard model, basic specification: ☐
- not available: ☐
Special Equipment and Accessories

Temperature range 300 °C for Universal Ovens
(not available for ovens with glass door; alternative solution: Order-No. B1)

- Additional chip card, blank, formatted (32 kB MEMoryCard XL for a maximum of 40 ramps)

Subframe with castors (height: size 500-600: 622 mm, size 700: 572 mm)

Software conforming to FDA “Celsius FDA-Edition” (extra)

- Additional Pt100 temperature sensor, positioned flexibly in chamber or load, for local monitoring
- Prevents undesired manipulation by unauthorised third parties

Door with lock (safety lock) (standard on size 700 + 800 sterilisers)

- Entry port (left centre/centre)
- Door hinged on the left
- Plug-in tube extension (angled)

Perforated stainless steel shelf, non-tipping

- Stainless steel tray (non-perforated) 15 mm rim, non-tipping

Stainless steel grid (for a total of 3 freely selected functions to be activated)

- Bottom drip tray

Entry port (left centre/centre)

- Other port (right rear)

Other port (38 mm diameter) at the back (please state location)

Wall bracket (tubular frame for wall mounting)

- Stacking version for 2 ovens of equal size (bottom oven modification)

Subframe with height adjustment (height: size 500-600: 622 mm, size 700: 572 mm)

Temperature profile writer/reader unit for programming via PC, for writing to and reading from the chip, up to 40 ramps

Additional chip card, blank, formatted (32 kB MEMoryCard XL for a maximum of 40 ramps)

STERICard (additional or as replacement) for automatic incubator chamber sterilisation cycle (not for sterilising the load!)

Oven-linked authorisation card (User-ID-Card) prevents undesired manipulation by unauthorised third parties

Computer interface RS485 (for networking a max. of 16 ovens) instead of RS232

Interface USB instead of RS232

- Interface USB connection cable for computer

Interface Ethernet instead of RS232 inclusive software “Celsius Ethernet-Edition”

- Parallel/USB converter cable with integrated power supply unit to connect HP printers with USB interface to MEMMERT units. Compatible with USB 1.1 and USB 2.0
- Documentation package consisting of parallel USB converter cable including PLC3-compatible HP colour inkjet printer with USB interface (HP Deskjet 9400 or successor) for direct connection of printer to Memmert unit

Connection cable for computer interface RS232 according to DIN 12 900-1

Flexible Pt100 for positioning in chamber or in load with socket according to NAMUR NE 28 for external temperature recording (load temperature)

- Potential-free contact (24 V/2 A) with socket to NAMUR NE 28 for external monitoring (indicates when setpoint is reached)
- Floating triple contact, for signal generation, controlled by programme segment (using PC), for combined fault message (e.g. supply failure, sensor fault, fuse)

Additional Pt100 temperature sensor, positioned flexibly in load, for local temperature measurement (up to 3 additional sensors are possible). The measured temperature can, if required, be indicated on the multifunction display, recorded in the integral ring store, and can be documented via the “Celsius” software or on an attached printer.

Interior lighting (up to size 600: 15 W, 700/800: 2 x 15 W)

Plug-in tube extension straight (188 mm, outer diameter 40 mm, inner diameter 38 mm) for exhaust air ducting (if necessary for connection to extraction system by hose)

Plug-in tube extension angled for exhaust air ducting

Works calibration certificate (U/S) at three temperatures: 100 °C, 160 °C, 220 °C

Works calibration certificate (I) for models at three temperatures: 37 °C, 52 °C, 70 °C

IQ check list with works test data for oven as support for validation by customer

OQ check list including one free-selectable temperature distribution survey to DIN 12880: 2007-05 (size 200/300: 9 measuring points, size 400-800: 27 measuring points) with works test data for oven as support for validation by customer

Software conforming to FDA “Celsius FDA-Editon” (extra cost)

---

Subject to technical modifications.

1) special equipment at no extra cost
2) affects temperature distribution.
3) see sketch page 26 resp. 27
4) for special equipment an advance payment of 20% of the complete price is required
5) height variable: minimum height specified
6) when inquiring please specify serial number
7) further temperature distribution surveys at extra cost
8) requires Windows 2000 Professional or XP Professional

---

Not available
### Special Equipment and Accessories

<table>
<thead>
<tr>
<th>Classes</th>
<th>Model sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Reinforced chamber 1) 2)</td>
<td>K1</td>
</tr>
<tr>
<td>Perforated stainless steel shelf, non-tipping, reinforced 3) for heavy loads (involves reinforced chamber)</td>
<td>E1(x)</td>
</tr>
<tr>
<td>Flush-fit unit 4) (stainless steel frame covering gap between oven and wall opening)</td>
<td>G1</td>
</tr>
<tr>
<td>Fresh-air filter 5) – filtration efficiency 80% – for UF/SF and additional subframe (for sizes 400-700) overall height in mm</td>
<td>R8</td>
</tr>
<tr>
<td>Interior nearly gastight (UN/IN) 1) 5)</td>
<td>K2</td>
</tr>
<tr>
<td>Ditto, with possibility for gas inlet/outlet through two tubes with ball valves</td>
<td>K3</td>
</tr>
<tr>
<td>Process-dependent electromagnetic door lock 1)</td>
<td>D4</td>
</tr>
</tbody>
</table>

### Technical data and dimensions about ovens and accessories 5)

#### Full-sight glass door B0

- Model 200
  - A = 330
  - B = 210
- Model 300
  - A = 410
  - B = 210
- Model 400
  - A = 330
  - B = 290
- Model 500
  - A = 490
  - B = 370
- Model 550
  - A = 410
  - B = 530
- Model 600
  - A = 254
  - B = 530
- Model 700
  - A = 374
  - B = 690
- Model 800
  - A = 374
  - B = 1090

#### Flush-fit unit G1

- The national fire safety regulations for the immediate surroundings have to be observed (F90 in Germany; exact dimensions on request)

#### Subframe with height adjustment G5

- Model 500
  - C = 622
- Model 550
  - C = 622
- Model 600
  - C = 622
- Model 700
  - C = 572

#### Subframe with castors G6

- Model 500
  - C = 622
- Model 550
  - C = 622
- Model 600
  - C = 622
- Model 700
  - C = 572

#### Wall bracket G0

- Model 100-700

#### Stainless steel grid E3(x)

- Model 100-800
  - D = 12

#### Stacking version G3

- Model 700 requires a stacking frame

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Subject to technical modifications.

1) for special equipment an advance payment of 20% of the complete price is required
2) increase of total height: size 500-700 by 20 mm, size 800 by 45 mm
3) see sketch below
4) technical clarification necessary
5) all dimensions in mm
**Entry ports at the side**  
(only E- and P-Ovens) Diameter 23 mm

<table>
<thead>
<tr>
<th>Standard ports F0, F1, F2, F3</th>
<th>Side port facilities F4(x), F5(x)</th>
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</thead>
<tbody>
<tr>
<td>Model 200-800</td>
<td>Model 100-500</td>
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</table>

**Port facilities in back panel**  
(only E- and P-Ovens) Diameter 23 mm and 38 mm alternatively 38 mm

<table>
<thead>
<tr>
<th>with fan F6(x), F7(x)</th>
<th>without fan F6(x), F7(x)</th>
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<tr>
<td>Model 400-800</td>
<td>Model 200-550</td>
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**Detail of working chamber with heating ribs**

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<tr>
<th>Sizes</th>
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Subject to technical modifications  
1) all dimensions in mm

If all shelf levels must remain usable the ports in the side panels must be positioned within the hairpins.
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Universal ovens
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Some of the illustrations in this publication include special accessories. We reserve the right of technical modifications. Dimensions are subject to confirmation.