



**memmert**  
Experts in Thermostatics

# Safety through experience

Temperature control appliances for the medical industry  
Clinics – Doctors' practices – Pharmacies

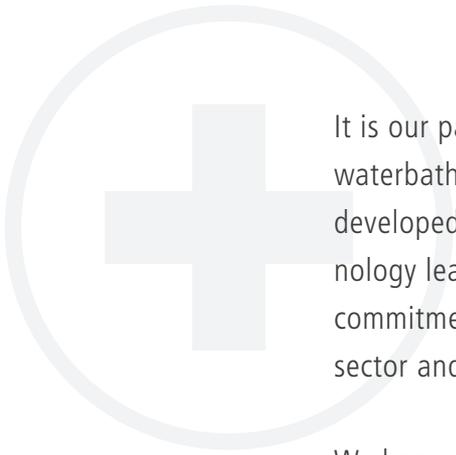


100% ATMOSAFE. MADE IN GERMANY.

[www.memmert.com](http://www.memmert.com) | [www.atmosafe.net](http://www.atmosafe.net)



# Quality creates trust



It is our passion for details that makes our heating ovens, incubators and waterbaths so precise and durable. The fact that all of our products are developed and manufactured exclusively in-house has made us technology leaders in temperature control appliances. It is our hard-lined commitment to quality that has made us a reliable partner in the medical sector and medical research industry ever since we started out in 1947.

We know that end-to-end quality assurance is crucial when it comes to health. Memmert has been DIN EN ISO 13485 certified for many years and offers a wide range of products, which are classified as medical devices under the European Medical Device Directive (93/42/EEC). The precise intended use of each product is listed in this brochure.

100% AtmoSAFE is our promise to you to guarantee a perfect atmosphere in all our appliances. What can we do for you?

Universal oven  
**Heating, drying, heated storage**

Blanket warmer  
**Warming, keeping warm**

Steriliser  
**Sterilising, depyrogenising**

Waterbath  
**Tempering**

Incubator  
**Incubating, warming and tempering**

Paraffin oven  
**Warming in nearly gastight interior**

**Temperature above  
room temperature**

Compressor cooled incubator  
**Incubating, warming and tempering**

Peltier cooled incubator  
**Warming, cooling, tempering**

**Temperature below  
room temperature**



**Temperature**

**Humidity**

**CO<sub>2</sub> and O<sub>2</sub>**

CO<sub>2</sub> Incubator  
**Cultivation of cells and tissue, in-vitro fertilisation  
and biosynthesis, gene expression**





## UNIVERSAL OVEN U/Um

32 to 1060 litres  
 +30 °C to +300 °C  
 Natural convection or  
 forced air circulation

The success story of Memmert began in the year 1947, with the development of a hot air steriliser for the Red Cross. Today, Memmert heating ovens are indispensable in medical laboratories, operation rooms and anaesthesiology departments in clinics.

They make a lasting impression with their aesthetics and user-friendly design coupled with unrivalled precision and reliability: corrosion-resistant, easy-to-clean stainless steel in the interior and outside, large-area all-round heating from four sides, device-specific interaction of heating and control.

### POSSIBLE APPLICATIONS

Heated storage of cultures and samples

Heating fango, silicate and APS packs for physical therapy and keeping them warm (medical device)



### We know how:

#### Precision and perfect temperature distribution

The smaller the heating elements in an oven, the more they must be heated up to reach the required temperature in the interior. A standard ring heater with an overall heating element length of one metre will even start to glow, making a gentle and accurate adjustment considerably more difficult to achieve.

A Memmert heating oven with a volume of 749 litres is surrounded on all sides by 52 metres of heating elements. Six heating circuits are controlled separately from one another so that the required temperature is exactly attained and maintained at every point in the interior – linearly and without fluctuations.

In a Memmert drying oven, the heating doesn't simply switch off when the set temperature has been reached but the temperature is controlled permanently, gently and evenly throughout the entire chamber. The logical consequence of this unique system: Excellent values for temperature homogeneity and temperature stability.



#### The universal oven Um is a medical device:

Memmert universal ovens Um are a Class I medical device in accordance with the EU directive 93/42/EEC. In accordance with the intended use Memmert heating oven UNm (with option A6) or UNmplus for heating fango, silicate and APS packs for physical therapy and keeping them warm.



## BLANKET WARMER IFbw

110 to 750 litres

+20 °C to +80 °C

Forced air circulation

Especially in emergency trauma rooms, temperature control systems are vital when attending to seriously injured patients. In a blanket warmer IFbw, blankets and cloths preheated to any precise temperature between 40 and 60 °C to keep patients warm before and after their surgery are always close at hand. This practice minimises the risk of complications such as wound infections, cardiovascular disorders, cardiac arrhythmia or vascular disorders.

The blanket warmer IFbw has an impressive range of safety features: The heating capacity is limited to 80 °C to prevent the cotton textiles from overheating if the cabinet is overloaded. Three platinum sensors monitor the surface temperatures inside the cabinet, which is also hermetically sealed, and the air in the cabinet is constantly circulated. An automatic door-open-recognition automatically switches the heater and fan off if the door is opened. Last, but not least, a mechanical temperature limiter interrupts the power supply at a max. temperature of 85 °C.

### POSSIBLE APPLICATIONS

Warming of non-sterile cloths and blankets (medical device)



## PARAFFIN OVEN UNpa

32 to 161 litres

+30 °C to +80 °C

For decades, the Memmert paraffin oven UNpa has helped employees in histology and pathology laboratories prepare microscopic slides. The high-quality heating oven made of hygienic, easy-to-clean stainless steel leaves nothing to be desired in terms of ventilation technology, control technology, overtemperature protection and precisely tuned heating technology.

Thanks to its high capillarity, liquid paraffin is an ideal embedding medium. However, this characteristic may cause the oily residues that form during heating to collect in small cavities. For this reason, the interior chamber of paraffin ovens UNpa is designed almost gas-tight. There is absolutely no danger of the ignition of residues or damage to mechanical and electronic components.

### POSSIBLE APPLICATIONS

Warming of paraffin and wax

### The blanket warmer IFbw is a medical device:

Memmert blanket warmers IFbw are a Class I medical device in accordance with the EU Directive 93/42/EEC. According to the intended purpose, Memmert blanket warmers are suitable for warming non-sterile blankets and cloths.





## CO<sub>2</sub> INCUBATOR ICOMed

56 | 107 | 156 | 241 litres

+18 °C to +50 °C

Humidity 40 - 97 % rh (as option)

CO<sub>2</sub>: 0 - 20 %

O<sub>2</sub>: 1 - 20 % (as option)

Safety at all times. The operating display, logging and CO<sub>2</sub> control of the CO<sub>2</sub> incubator ICOMed stay functional when there is a power failure thanks to the battery-buffered ControlCOCKPIT. The fine-tuned control guarantees that the set-point temperature is reached without temperature overshoots. Rounded corners allow for easy cleaning of the interior, which can also be sterilised together with all installations and sensors within 60 minutes at 180 °C.

All parameters are logged in accordance with the FDA and, a particularly important feature regarding safety, when the individually adjustable ranges for CO<sub>2</sub>, O<sub>2</sub>, temperature and humidity are surpassed, the ICOMed can send notification to a mobile phone.

The Memmert active humidity control offers the best protection for cell and tissue cultures. It minimises vaporisation in the interior and ensures short recovery times after the door has been opened. All-round heating of the interior and the heated inner glass door additionally prevent the dangerous formation of condensation.



### The CO<sub>2</sub> Incubator ICOMed is a medical device:

Memmert subjected its CO<sub>2</sub> incubator ICOMed to a comprehensive medical device evaluation. Every Memmert CO<sub>2</sub> incubator ICOMed is classified as a Class IIa medical device. The ICOMed is intended for the creation and maintenance of constant environmental conditions for application in the field of in-vitro fertilisation (IVF), especially for the incubation of oocytes, spermatozoa and zygotes in special culture dishes for IVF application as well as for gene expression and the biosynthesis of RNA and proteins. The CE label on the appliances includes the mark 0197, denoting TRLP – TÜV Rheinland as the notified body.



## The CO<sub>2</sub> incubator from a scientific point of view

The ideal conditions are clearly defined: Constant temperatures in the entire interior of the incubator, humidity as high as possible to avoid osmotic fluctuations, but no condensation whatsoever. The gas atmosphere needs to be individually adjustable and highly constant in daily operation, the device needs to be clearly arranged and decontamination and cleaning must be easy. Incubators for in-vitro cultivation should be designed in such a way to meet the GCCP (Good Cell Culture Practice) requirements. This may sound easy, but for the technical realisation, high expertise, technical skills, intelligent control and comprehensive knowledge of the various requirements in the laboratory are required.

Source and more information:

„Warum wir endlich eine Good Cell Culture Practice brauchen!“ (Why we need Good Cell Culture Practice now!), Professor Dr. rer. nat. Gerhard Unteregger, diploma in biology, in-vitro – Institute for Molecular Biology, published in BIOSpektrum 12/08



### Application:

## Chronobiology provides an insight into the body

Tests on gene expression aim to explore the mechanism of the body clock at a biomolecular level. This is done using two Memmert CO<sub>2</sub> incubators at the Institute of Pharmacology and Toxicology of the University of Zurich. To visualise the processes in-vitro, researchers use a trick. They use bioluminescence, the ability of insects and other creatures to produce light. The luciferase gene, which is responsible for light production, is transfected under the control of a "clock gene" into the cell which is investigated. This "reporter" makes the cells light up as soon as the gene is activated. The intensity of the light radiation is measured in the CO<sub>2</sub> incubators with the help of a robot. Even minimum light incidence in the CO<sub>2</sub> incubator can falsify test results.

Thus, total darkness is an absolute must. The appliances are placed in a separate, air-conditioned, dark room, and even the integrated CO<sub>2</sub> sensors were sealed as they emit a small amount of light.

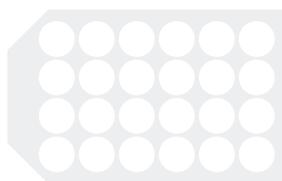
### We know how:

## When it comes to cell cultivation, active humidification and dehumidification is a must

The COSIR research project, with scientific support from the chair of bioprocess engineering at the University of Erlangen, was dedicated to one of the most important challenges for cell cultivation in laboratories: evaluating cell growth without invasive methods such as sample taking. Memmert contributed to the success of the project by providing an INCOmed CO<sub>2</sub> incubator.

At the beginning of the project, the incubator was evaluated and the result showed that the active humidification system decreases evaporation considerably compared to incubators with passive humidification. In cell cultivation in multiwell plates, evaporation and condensation cause fluctuations in the concentration, which may significantly falsify test results. During the evaluation, the CO<sub>2</sub> incubator was used by several employees and the door was frequently opened. The excellent responsiveness of the active humidification system to the continuous change of the gas mixture in the chamber humidified to 95 % rh, became apparent after the INCOmed was tested for 10 days. Caused by the frequent opening of the door, the outer well rows had lost about 40 % of their humidity content, while the inner rows had only lost about 10 %. On non-workdays, a constant volume and an increase in humidity content were determined.





## INCUBATOR I/Im

32 to 749 litres

+30 °C to +80 °C

Natural convection or  
forced air circulation

The heating and temperature control in Incubator I/Im were specifically designed for low temperatures from +30 °C to +80 °C. You can be certain that your chamber load will be heated most gently and without any temperature overshoots. During the heating process, the temperature is increased within a very narrow control range and kept exactly at the set value. A pre-heating chamber heats up the supplied air, so that no temperature deviations can occur in operation. The chamber of the INplus/INmplus and IFplus/IFmplus models can be sterilised, along with all installations, at +160 °C in a 4-hour programme.

### POSSIBLE APPLICATIONS

Microbiological tests

Germ count determination

Heated storage of cultures and samples

Warming of rinsing solutions and infusions  
as well as of contrast agents (medical device)

Heating fango, silicate and APS packs and  
keeping them warm (medical device)

## Application Im:

### Warming of infusion solutions in the incubator

The famous English architect Sir Christopher Wren was a typical 17<sup>th</sup> century man. As a universal genius, he was not only interested in the art of construction. He built a rain gauge and, as far as it is currently known, he was the first one to experiment with infusions – that is with delivering liquids and drugs to patients directly through the veins. Since syringes had not been invented yet, he used the thigh bone of a nightingale to inject wine and beer into the veins of a dog in 1656. In the 18<sup>th</sup> century, the invention of sugar solution represented a further milestone. But it wasn't until the 19<sup>th</sup> and 20<sup>th</sup> century, when hygiene and microbiology were further developed, that infusion therapy finally made a breakthrough.

The district clinic of Roth uses several Memmert products to keep rinsing solutions at a constant temperature of 37 °C in its operation rooms.



#### The incubator Im is a medical device:

The incubator Im is a Class I medical device in accordance with the EU directive 93/42/EEC. In accordance with the intended use incubators INmplus and IFmplus may be used for warming of rinsing solutions and infusions as well as of contrast agents. Incubators INm (with option A6) are intended for heating fango, silicate and APS packs for physical therapy and keeping them warm.



## PELTIER-COOLED INCUBATOR IPP

32 to 1060 litres, 0 °C to +70 °C

Excellent controllability, extremely small control fluctuations, low-vibration operation and impressive energy savings provide the added value from the Peltier technology in the Memmert cooled incubators of the IPP series. In medical laboratories tests and processes must be repeatable and documentable under precisely defined conditions. The Memmert IPP Peltier-cooled incubators operate at high precision, without vibration and in addition provide unparalleled energy efficiency, as, in contrast to compressor technology, energy is only used during the heating or cooling process. The advantages: The risk of the sample drying out is minimal, since condensation formation during the cooling down process takes place outside the working chamber on the Peltier element. As the IPP cooled incubator does not need a compressor, it saves valuable space in the laboratory.

If, for your application, you need fast and precise switching between heating and cooling phases in ramp operation, then the compressor-cooled incubator ICP with a temperature range between -12 °C and +60 °C is the right choice from the Memmert portfolio.

### POSSIBLE APPLICATIONS

- Microbiological tests
- Germ count determination
- Cultivation below and above room temperature
- BSB5 and BSB7 determination



## COMPRESSOR COOLED INCUBATOR ICP

53 to 749 litres

-5 °C to +60 °C (ICP55)

-12 °C to +60 °C

(ICP110 - ICP750)

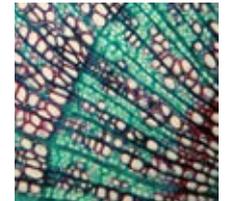
If a large number of samples have to be permanently incubated, you can rely on the maximum utilisation of the chamber in the cooled incubator ICP. After all, of what use is a large chamber if some levels cannot be used after validation?

And if rapid and precise alternation between heating up and cooling down phases in ramp operation is called for, Memmert cooled incubators with compressor cooling prove to be in top form. Thanks to the finely adjusted control technology, temperatures reach the set point precisely, without energy-intensive re-adjustment and without any temperature fluctuations.

If you need particularly precise temperature control in combination with low-noise and vibration-free operation, the Memmert Peltier-cooled incubator with its temperature range between 0 °C and +70 °C is just the right choice for you.

### POSSIBLE APPLICATIONS

- Tempering of samples and plates
- Tempering of breeding media and emulsions
- Cultivation above and below room temperature



## STERILISER S

32 to 749 litres  
+30 °C to +250 °C

The Memmert hot-air steriliser is applied as medical device for the sterilisation of medical material with dry heated air at atmospheric pressure. Strict hygienic conditions prevail in laboratories, medical and veterinarian practices, clinics and hospitals as well as in pharmacies. Therefore, disinfection of receptacles and instruments is not enough. Only sterilisation provides sufficient protection. The setpoint-dependent programme resume function SetpointWAIT guarantees precise sterilisation times and the complete killing off of even the most resistant microorganisms.

### POSSIBLE APPLICATIONS

Sterilisation of medical instruments and laboratory glass

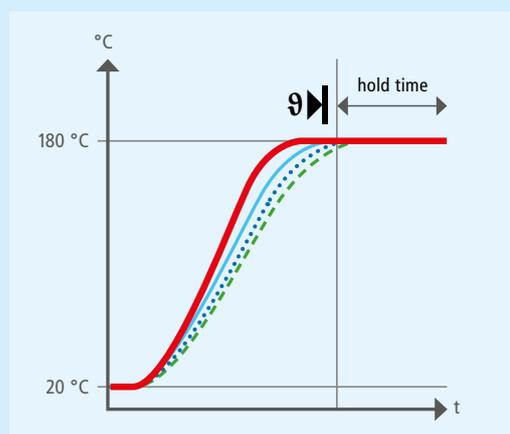
Depyrogenisation

### We know how:

#### SetpointWAIT function / Process validation

The SetpointWAIT function ensures that the programme is not resumed before the setpoint temperature is reached. If the additional, freely positionable Pt100 temperature sensors are used, sterilisation begins once the setpoint temperature is reached at all measuring points – in the chamber load. Precisely maintaining the sterilisation time and thus completely killing off even highly resistant microorganisms is therefore guaranteed at all times, irrespective of the sterilisation load and chamber volume.

Thanks to the SetpointWAIT function, a process validation based on the guidelines of the DGKH (German Society for Hospital Hygiene) as well as on the ISO 20857:2010 standard is easily possible.



— Temperature of the Pt100 sensor inside the chamber

- - - Temperature of the flexible Pt100 sensors inside the chamber



**The steriliser SN/SF/SNplus/SFplus is a medical device:**

All Memmert sterilisers are classified as class IIb medical device. The appliances may be used for sterilising medical material through dry heat at atmospheric pressure. They are also suited without restriction for the special application of depyrogenisation with hot air.





## Application W: Extracting lanolin in a waterbath

Already in the 1st century A.D., the Greek physician Pedanios Dioskurides described a procedure to obtain lanolin by boiling sheep's wool in his famous encyclopaedia "De materia medica". The procedure had fallen into long oblivion, but by the end of the 19th century lanolin had a comeback in pharmacology as a base for balms. Lanolin is absorbed well by the skin, has a moisturising effect and accelerates wound healing.

The pharmacy in the district hospital of Roth also manufactures balms based on lanolin following their own formula, e.g. as an emulsion for the nose that supports the healing process after a nose surgery. Lanolin is extracted at 100 °C in a Memmert waterbath that has been doing its job reliably for 30 years.



## WATERBATH WNB/WNE/WPE

7 to 45 litres

+30 °C to +95 °C plus boiling stage

Cooling device CDP115 from +10 °C (as option)

Model size 45 with and without circulating pump

The Memmert waterbath is available in six model sizes and two performance classes. In addition to the Basic model for standard temperature control tasks, the Excellent version provides precise test procedures with maximum safety: The superior heating concept of Memmert ovens can also be found in the waterbaths. The heating elements are located under deep-drawn, easy to clean ribs, where they are protected from water and thus from corrosion and calcification.

If constant set point temperatures close to ambient temperature are needed in the waterbath, the CDP115 Peltier cooling unit cools the medium in a precise and environmentally friendly manner down to 10 °C with an accuracy of  $\pm 0.1$  K.

## Waterbath cooling with Peltier technology

As the first manufacturer worldwide, Memmert has launched a Peltier cooling unit compatible with all Memmert waterbaths. Especially at temperatures close to the ambient temperature, the extremely smooth-running CDP115 cooling unit operates precisely, economically and in an environmentally-friendly way. The medium can be cooled down to 10 °C with an accuracy of  $\pm 0.1$  K. The Peltier cooling unit saves space in the laboratory, is easy to install thanks to a practical snap-on technology and does not require any refrigerant.

### POSSIBLE APPLICATIONS

Tempering of balms and emulsions

Tempering of nutrient solutions

Warming of baby food



# Overview of possible applications

There is certainly a huge number of other application possibilities. We would be very pleased if you could tell us about your applications. Whatever the material, whatever the appliance and wherever you may be!

We would love to discuss with you your individual task at hand in order to find a suitable solution in the context of our standard programme or our customised designs.

Application	Appliance	Parameters
Warming of non-sterile blankets and cloths	Blanket warmer <b>IFbw</b> (Medical device as class I)	+20 °C to +80 °C
Warming of rinsing solutions, infusions as well as contrast agents	Incubator <b>Im</b> (Medical device class I)	+30 °C to +80 °C
Sterilisation of medical instruments and laboratory glass	Steriliser <b>SN/SF/SNplus/SFplus</b> (Medical device class IIb)	+30 °C to +250 °C
Cultivation of cells and tissue, in-vitro fertilisation and biosynthesis, gene expression	CO <sub>2</sub> Incubator <b>IComed</b> (Medical device class IIa)	+18 °C to +50 °C CO <sub>2</sub> : 0 to 20 % humidity: 40 to 97 % rh (optional) O <sub>2</sub> : 1 to 20 % (optional)
Heated storage of cultures and samples	Incubator <b>I</b>	+30 °C to +80 °C
Heating fango, silicate and APS packs for physical therapy and keeping them warm	Incubator <b>Im</b> (Medical device class I)	+30 °C to +80 °C
	Universal Oven <b>Um</b> (Medical device class I)	+30 °C to +300 °C
Tempering of balms and emulsions	Waterbath <b>WNB/WNE/WPE</b>	+30 °C to +95 °C boiling stage (with cooling unit CDP115 from +10 °C)
Tempering of samples, plates, breeding media and emulsions in the laboratory	Incubator <b>I</b>	+30 °C to +80 °C
	Cooled incubator <b>IPP</b>	0 °C to +70 °C
	Cooled incubator <b>ICP</b>	-12 °C to +60 °C
	Waterbath <b>WNB/WNE/WPE</b>	+30 °C to +95 °C + boiling stage (with cooling unit CDP115 from +10 °C)
Microbiological tests, germ count determination, cultivation above and below room temperature	Incubator <b>I</b>	+30 °C to +80 °C
	Cooled incubator <b>ICP</b>	-12 °C to +60 °C
	Cooled incubator <b>IPP</b>	0 °C to +70 °C
	Cooled storage incubator <b>IPS</b>	+14 °C to +45 °C
Warming of paraffin and wax	Paraffin oven <b>UNpa</b>	+30 °C to +80 °C
Warming of baby food	Waterbath <b>WNB/WNE/WPE</b>	+30 °C to +95 °C boiling stage (with cooling unit CDP115 from +10 °C)