memmert

Experts in Thermostatics

CO_2 Incubators **INCO 2**

Safe and precise control of CO_2, humidity and temperature

Humidity control from 88%-97% rh – optional active humidifying system adjustable from 40% to 97% rh

Working chamber including ventilation system, water trays as well as all sensors sterilisable without problems

Triple precision

For safe processes

Contamination? Not with us!

>>>> www.memmert.com

Stainless steel – the noble material

The new INCO 2 – this is fine-tuning to perfection: for absolutely reliable experimental procedures with a maximum of security and operating convenience.

The inner chamber of the INCO 2 consists exclusively of high-grade and fully recyclable stainless steel. The additional electropolishing of the chamber ensures particularly smooth and hygienic surfaces and therefore the greatest possible reduction in contamination risk. The outer casing is made mainly from sturdy textured stainless steel (except rear of zinc-plated steel) and is in accord with Memmert's holistic quality philosophy.

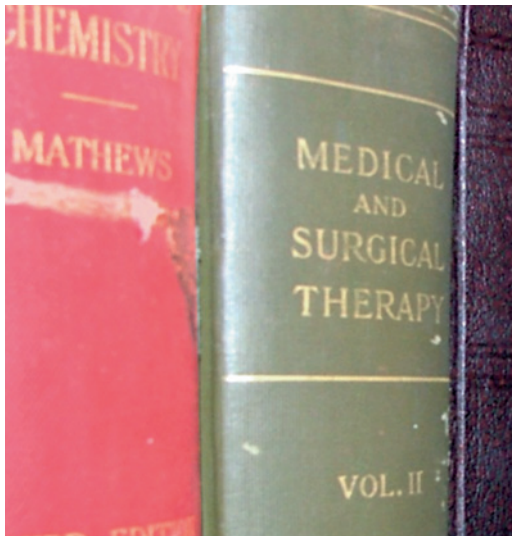
Bacteria-free through sterilisation function – desinfection is not sufficient!

Hygiene is fundamental in high-sensitivity applications with organic materials. For that reason the entire chamber, including the ventilation system, the water tank and all sensors can be sterilised at 160°C in a 4-hour programme. The infrared CO_2 sensor was specially designed by Memmert engineers to withstand without damage the 160°C sterilisation temperature over the entire 4-hour period. For safety reasons this function can only be operated by means of the Memmert STERICard in order to prevent unintentional activation.

The professional CO_2 – working for man and nature

CO_2-atmosphere up to 20%, accurate temperature control up to 45°C and humidity limit control up to 97% rh without condensation combine to create inside the INCO 2 a controlled and physiologically ideal environment for cell and tissue cultures growing in vitro.

3 sizes:
108 - 153 - 246 litre chamber volume

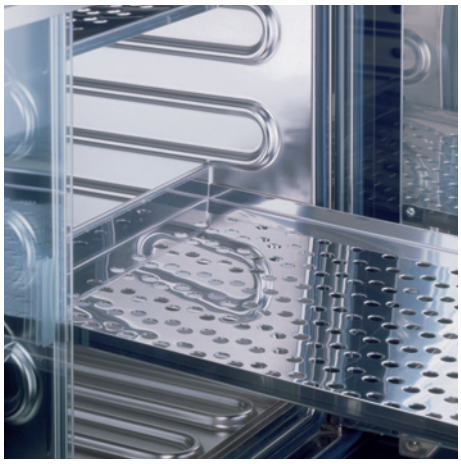


Uniformity inside the chamber

Chamber heating from all six sides, together with electronic humidity limit control, is mainly responsible for preventing condensation in the chamber. An aluminium heat-conducting jacket helps to ensure optimal temperature distribution and in addition serves as heat store in case of a temporary supply outage.

Despite the appreciably higher density of CO_2 compared with air, the turbulence-free chamber ventilation provides a uniformly homogeneous atmosphere.

A Memmert special: the chamber is made to 100% of high-grade stainless steel (Mat. 1.4301) and is additionally electropolished for maximum protection against dangerous contamination.



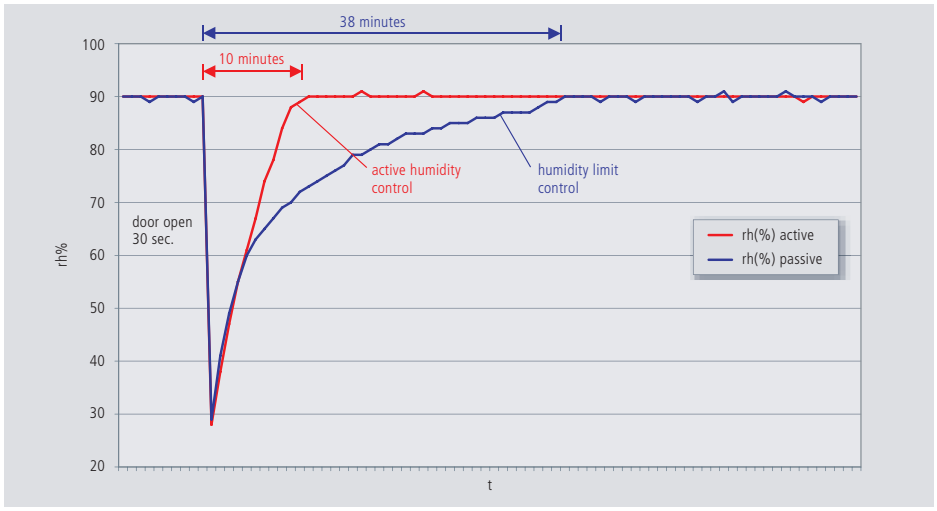
A Memmert special: the all-round heating is located below deep-drawn ribs which carry the anti-tipping stainless steel shelves and at the same time ensure optimal and particularly gentle heat transfer to the incubator load.

Active humidity control

In addition to CO_2 content, a stable and accurately adjustable humidity plays a decisive role in creating physiologically ideal ambient conditions for the incubator load.

Memmert offers the INCO 2 in two variants. As standard it is equipped with a humidity limit control by which the maximum relative humidity created by water dishes in the chamber can be reduced from 97% down to 88%. At extra charge an active humidification system can be incorporated, with controlled evaporation of water through a steam generator and sterile dry steam mixed into the air flow. This system offers an extended control range of 40% to 97% rH.

Your advantage: more useful volume, reduced contamination risk and short recovery time after opening the door.



The difference in humidity recovery time between humidity limit control and active humidity control (example: INCO 2/108).

There is no such thing as a little reliability!

The new INCO 2 is a model of reliability and accuracy. Innovations in control engineering ensure maximum security and reliability. And surprise: this breadth of functionality is obtained with even more convenience and ease of operation!

Accuracy: for regulated procedures

Technical features for faultless processes:

- Internal ventilation for turbulence-free and uniform distribution of CO_2, humidity and temperature
- Multifunctional fuzzy-supported control for exact setting and maintenance of temperature, humidity and CO_2 content
- Calibration facility for temperature, CO_2 and humidity on the actual controller
- Option (extra charge): up to three additional and freely positionable Pt100 sensors for indication on the display and recording in the document store
- Digitised NDIR CO_2 sensor with cyclic auto-zero function
- Compensation for atmospheric pressure errors through internal barometric pressure measurement

Security: of course!

Still more functions with no error:

- Integral auto-diagnostic system with visual and audible error indication
- Triple temperature monitor with mechanical temperature limiter (TB), electronic adjustable temperature monitor (TWW), as well as the Memmert ASF (Auto-Safety Function): two high-grade platinum sensors communicate with each other like a climbing team on a rope and secure uninterrupted faultless temperature control. The high-grade 4-wire circuit ensures precise transmission of the measurements.
- Audible signal on over- and undertemperature, over- and under-CO_2, open door and empty gas cylinder
- Option (extra charge): volt-free contacts on "combination error" and "setpoint reached"
- Option (extra charge): personal User-ID-Card for protection against unauthorised operation

Convenience: made for you

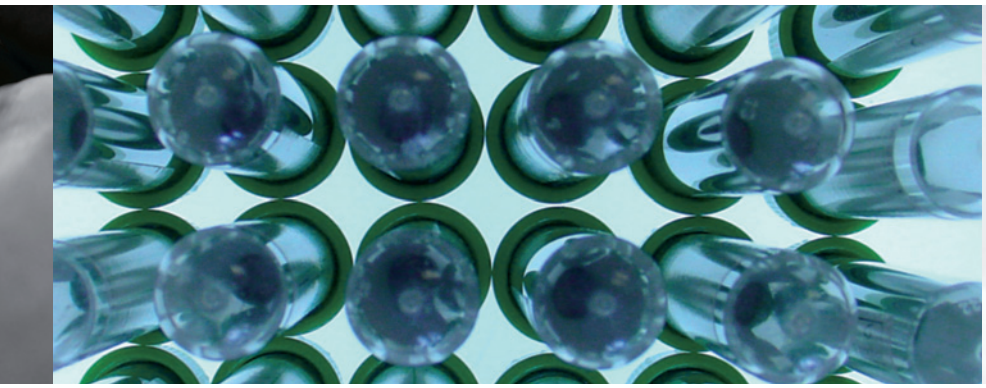
The INCO 2 is easy to use:

- Clear, easy-to-clean underglass function display
- Memmert's unique feature: the push-turn control (patent applied for) for intuitive selection from the entire menu
- Feet with height adjustment as standard
- Auto start-up programme
- Automatic gas cylinder changeover
- Quick-release connectors on CO_2 intake, also for water supply on active humidity control
- Fully insulated stainless steel door and additional glass door

Documentation: for controlled quality

The basic outfit for professional quality assurance:

- Standard "Celsius" software for programming and documentation, also optional FDA-conforming software (extra charge)
- Internal ring memory for uninterrupted, long-term documentation fully protected against manipulation (approx. 3 months).
- RS232 interface (RS485 option without extra charge) for programming, storage, and printer interface for printing temperature processes



Timer module

1 time indication (real-time)

2 text messages

Temperature module

11 heating

12 sterilisation operation

13 setpoint/actual temperature

- Temperature adjustment: 20 – 45°C (control range from 8°C above ambient temperature up to 45°C)
- variation (time): ±0.1°C max.
- uniformity (spatial): ±0.3°C max.

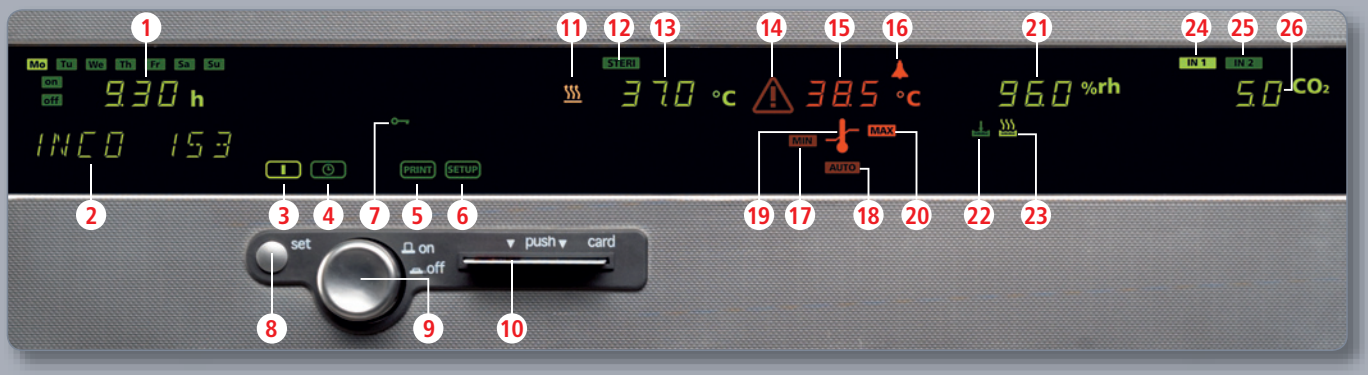
CO_2 module

24 gas cylinder 1 (active)

25 gas cylinder 2

26 CO_2 setpoint/actual

- CO_2-concentration selection 0-20% (adjustable in 0.1% steps)
- variation (time) ±0.1% CO_2 max.
- uniformity (spatial) ±0.3% CO_2 max.



Operating mode

3 normal operation

4 weekly timer*

5 printer

6 configuration

7 data manipulation prevented through optional User-ID-Card (extra charge)

8 SET key

9 push-turn control

10 chip card reader for STERICard and optional User-ID-Card

* Weekly timer programmable with one ON and OFF time per weekday; additional group function

Monitor module

14 visual alarm

15 alarm limit

16 sounder

17 low alarm limit

18 automatic alarm limit (ASF)

19 temperature limiter

20 high alarm limit

Audible and visual alarm on temperature and CO_2 out of limit, on door open longer than 2 minutes, and on other errors

Humidity module

21 setpoint/actual humidity

22 water level in storage tank

23 steam generation

- Humidity selection 40-97% rh with active humidity control
- Humidity selection 88-97% rh with humidity limit control (selected in 1% steps)
- variation (time) ±1% rh max.

Technical data, models and accessories for CO_2 Incubators INCO 2

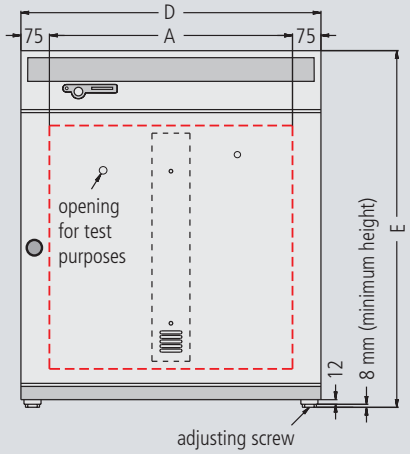
Interfaces:

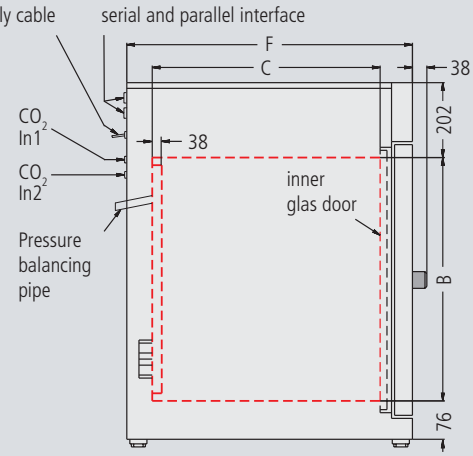
RS 232 alternative RS 485

printer interface

CE

Dimensions of CO_2 Incubators (see table below)





Model sizes			INCO 2	108	153	246
Stainless steel interior (deep-drawn, electropolished)	Volume		approx. l	108	153	246
	Width / Height / Depth (less 25 mm for air duct in the middle of the back wall)(A) / (B) / (C)		mm	560 / 480 / 400	480 / 640 / 500	640 / 640 / 600
	Provision for sliding stainless steel shelves resp. wire grid shelves half width / full width		number	– / 4	– / 6	2 x 6 / 6
Stainless steel exterior (rear zinc-plated steel)	Width	(D)	mm	710	630	790
	Height (variable through adjustable feet)	(E)	mm	778	938	938
	Depth (without door handle, depth of handle 38 mm)	(F)	mm	550	650	750
	Fully insulated, heated stainless steel door			☐	☐	☐
	Extra internal glass door			☐	☐	☐
Ventilation	Uniform atmosphere and temperature distribution through enclosed non-turbulent ventilation system, fully covered by the sterilisation process			☐	☐	☐
Temperature	Electronic microprocessor temperature controller with Pt100 and auto-diagnostic system			☐	☐	☐
	Temperature sensors Pt100 Class A in 4-wire circuit for uninterrupted operation on failure of one Pt100 with warning indication			double	double	double
	Temperature range (during sterilisation the temperature is fixed at 160 °C – set value)		° C	from 20[1] up to 45	from 20[1] up to 45	from 20[1] up to 45
	Temperature fluctuations with time (to DIN 58 945)		° C	≤ ± 0,1	≤ ± 0,1	≤ ± 0,1
	Temperature variation in chamber at 37 °C (to DIN 58 945)		° C	≤ ± 0,3	≤ ± 0,3	≤ ± 0,3
Sterilisation	STERICard for automatic chamber sterilisation cycle 4 h at 160 °C (not for sterilising the load!)			☐	☐	☐
CO_2	Digital electronic CO_2 control with autozero, NDIR system and integrated gas cylinder change-over, with auto-diagnostic system and acoustic fault indication			☐	☐	☐
	Setting accuracy		CO_2	± 0,1 %	± 0,1 %	± 0,1 %
	Adjustment range		CO_2	0 up to 20 %	0 up to 20 %	0 up to 20 %
Humidity	Capacitive humidity sensor (sterilisable)			☐	☐	☐
	Standard water dishes		number	1	1	2
	Adjustable humidity limit control (88 – 97%) incl. digital indication and auto-diagnostic system with visual and acoustic fault indication (air supply via sterile filter) ensures rapid reaching of set humidity and short recovery times while avoiding condensate formation			☐	☐	☐
Monitor	Microprocessor temperature monitor acting as overtemperature protection, with Pt100 incorporating fault diagnostics with visual and audible alarm			☐	☐	☐
	Digital over- and under- temperature monitor			☐	☐	☐
	Setpoint linked gliding automatic safety function (ASF)			☐	☐	☐
	Relay for reliable heating cut-off in case of fault			☐	☐	☐
	Mechanical temperature limiter (TB)			☐	☐	☐
	Audible alarm: Over- and undertemperature, over- and under-CO_2, open door and empty gas cylinder			☐	☐	☐
Timer functions	Real-time/weekly programmer with group function (e.g. every weekday)			☐	☐	☐
Documentation	Internal documentation memory 1024 kB as ring memory for all setpoints, actual values, errors, settings with real-time and date; capacity approx. 3 months at 1 min intervals			☐	☐	☐
	Parallel printer interface for printing documentation data, suitable for all PCL3-compatible ink jet printers			☐	☐	☐
	„Celsius 2007"[2] software for control and documentation of temperature, CO_2 and relative humidity			☐	☐	☐

Model sizes		INCO 2	108	153	246
Setup	Calibration (no separate PC required): Temperature: 3-point calibration on controller CO_2: 3-point calibration at 5%, 10% and 15%, Auto-zero-function of NDIR CO_2-sensor upon switching on and cyclically every 24 h Humidity: 2-point calibration at 20% and 90%		☐	☐	☐
	Setting of language for dialogue resp. display D / UK / E / F / I		☐	☐	☐
Further data	Electrical load with electrical supply of 230 V[4] (±10%), 50/60 Hz	approx. W	1000	1500	2000
	Net weight / Gross weight	approx. kg	70 / 78	82 / 114	110 / 160
Standard accessories	2 connecting hoses with two quick-release couplings to 2 gas cylinders (automatic gas cylinder change over)		☐	☐	☐
	Removable 4-part partitioning of interior with 4-part gas baffle		–	–	☐
	Stainless steel sliding shelves (half width / full width)	number	– / 3 ☐	– / 3 ☐	6 ☐ / –
	Shelf or wire grid shelf width (half width / full width)	approx. mm	560 (full width)	480 (full width)	300 / 640
	Shelf depth	approx. mm	300	400	500
	Stainless steel water dishes, electropolished	number	1 (full width)	1 (full width)	2 (half width)
	Width of dish	approx. mm	535 (full width)	455 (full width)	280 (half width)
	Depth of dish / height of dish	approx. mm	250 / 40	350 / 40	450 / 40
	Works calibration certificate (test point chamber centre at 37 °C)		☐	☐	☐
Standard version	Incubator INCO 2		INC 108	INC 153	INC 246
Options	Active microprocessor control for humidifying and dehumidifying (40 – 97 % rh), incl. digital indication and auto-diagnostic system ensures even more rapid reaching of set humidity and very short recovery times while avoiding condensate formation; humidity supply with distilled water (from an external tank) by a self-priming pump; integral bacteria block by generating hotsteam, dehumidifying via sterile filter; (standard humidity limit control and water dishes are omitted). Can only be ordered together with new incubator (no retrofitting possible)		K7	K7	K7
	Additional Pt100 temperature sensor, positioned flexibly in chamber or 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 2007"[2] software or on an attached printer		H8(x)	H8(x)	H8(x)
	Reduction if 4-part partitioning of interior with gas baffle is omitted (replacement of 6 half-width shelves by 3 full-width wire grid shelves)		–	–	K4[7]
	Extra stainless steel shelf, half width		–	–	E6(x)
	Extra stainless steel shelf, full width		E7(x)	E7(x)	–
	Extra wire grid shelf, full width		E3(x)	E3(x)	E3(x)
	Extra water dish		E2(x) (full width)	E2(x) (full width)	E2(x) (half width)
	Pressure reducing valve to DIN 8546, incl. gas cylinder monitor		H7	H7	H7
	Computer interface RS485 (for networking a maximum of 16 ovens) instead of interface RS232		○ / V2	○ / V2	○ / V2
	Connection cable for computer interface RS232 according to DIN 12 900-1		V6	V6	V6
	Potential-free contact (24 V/2 A) with socket to NAMUR NE 28 for external monitoring (setpoint of temperature and CO_2 is reached)		H5	H5	H5
	Potential-free contact (24 V/2 A) with socket to NAMUR NE 28 for combined fault message of temperature and CO_2 controller (e. g. supply failure, sensor fault or fuse)		H6	H6	H6
	Subframe (622 mm high)[5]		G5	G5	G5
	Subframe (130 mm high for 2 stacked incubators)[5]		G7	G7	G7
	Stacking version for 2 units of equal size (bottom unit modification)		G3	G3	G3
	Works calibration certificate for 5%, 10% and 15% CO_2 (measured at 37 °C)		Z5	Z5	Z5
	Oven-linked authorisation card (User-ID-Card) prevents undesired manipulation by unauthorised third parties		V1	V1	V1
	IQ check list with works test data for incubator as support for validation by customer		Q1	Q1	Q1
	OQ check list including one free-selectable temperature distribution survey to DIN 12880 for 9 measuring points[8] with works test data for CO_2 and humidity as support for validation by customer		Q2	Q2	Q2
	Software „Celsius 2007 FDA Edition"[3] Meets the requirements for the use of electronically stored data sets and electronic signatures as laid down in Regulation 21 CFR Part 11 of the US Food and Drug Administration (FDA)		Q3	Q3	Q3
	Start-up of INCO incubators and brief training[6] (Germany only) through MEMMERT service. Requirement: incubator is at its final location and all services have been provided by the purchaser. (Applies only in connection with orders and payments for new units)		K9	K9	K9

Subject to technical modifications
☐ standard model, basic specification
○ special equipment at no extra cost
– not available
(x) Please specify quantity required after the order number

1) operating range from 8 °C above ambient
2) MEMMERT "Celsius 2007" software has been tested for Windows NT 4, 2000, XP and is in preparation for Windows Vista
3) requires Windows 2000 Professional or XP Professional
4) other voltages upon request

5) Screws for adjusting height are taken out of the feet and mounted into the subframe
6) Service not subject to any discount
7) Reduction of price
8) further temperature distribution surveys at extra cost

OUR PROGRAMME

Universal ovens
Incubators
Hot air sterilisers
Ovens

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Compressor-cooled incubators
Cooled incubators

CO_2 incubators

Humidity chambers

Water and oil baths

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