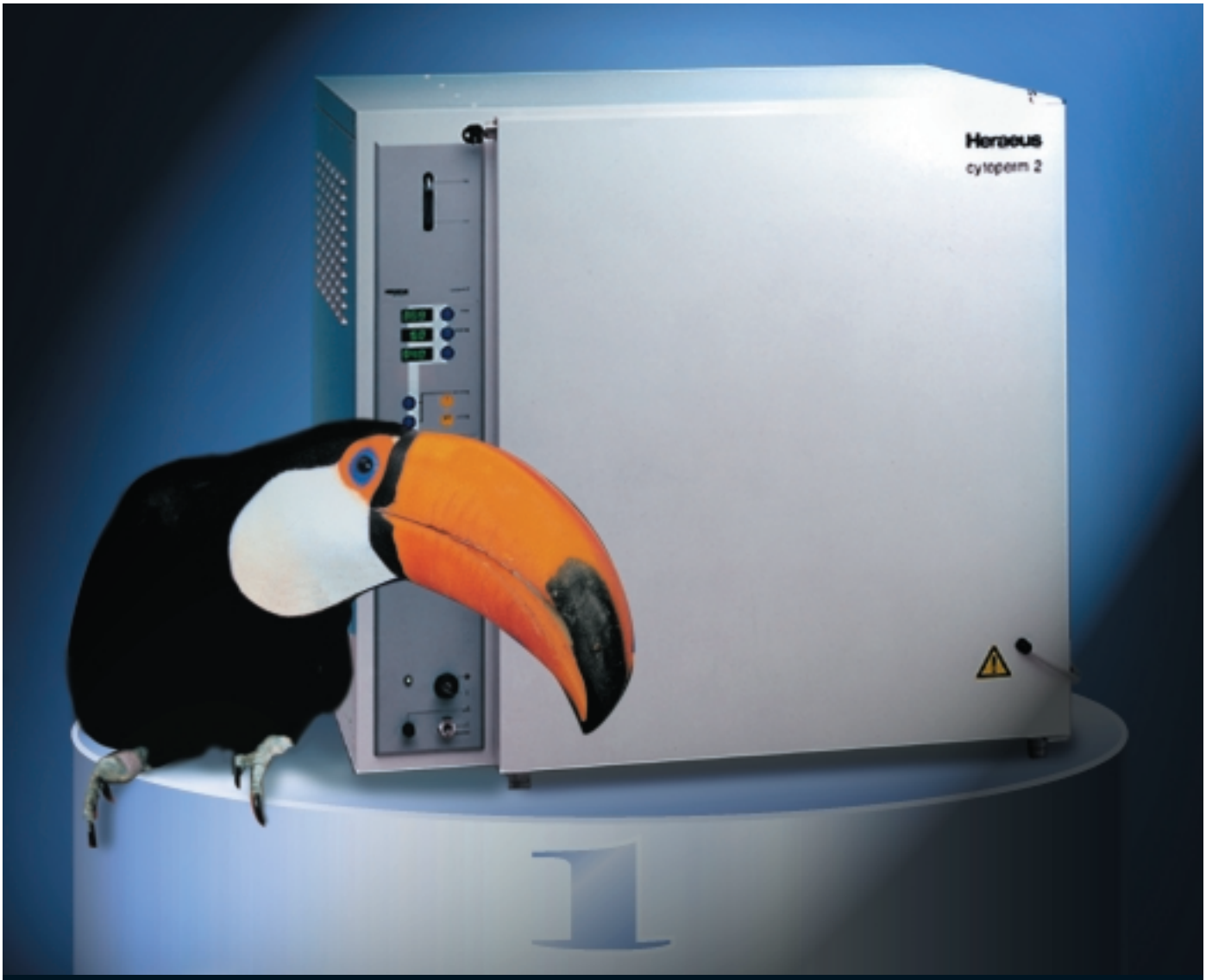
TT-LB/cy2e

Heraeus

CYTOPERM® 2
CO_2- AND CO_2/O_2 INCUBATOR

Contamination protection that's in a class of its own



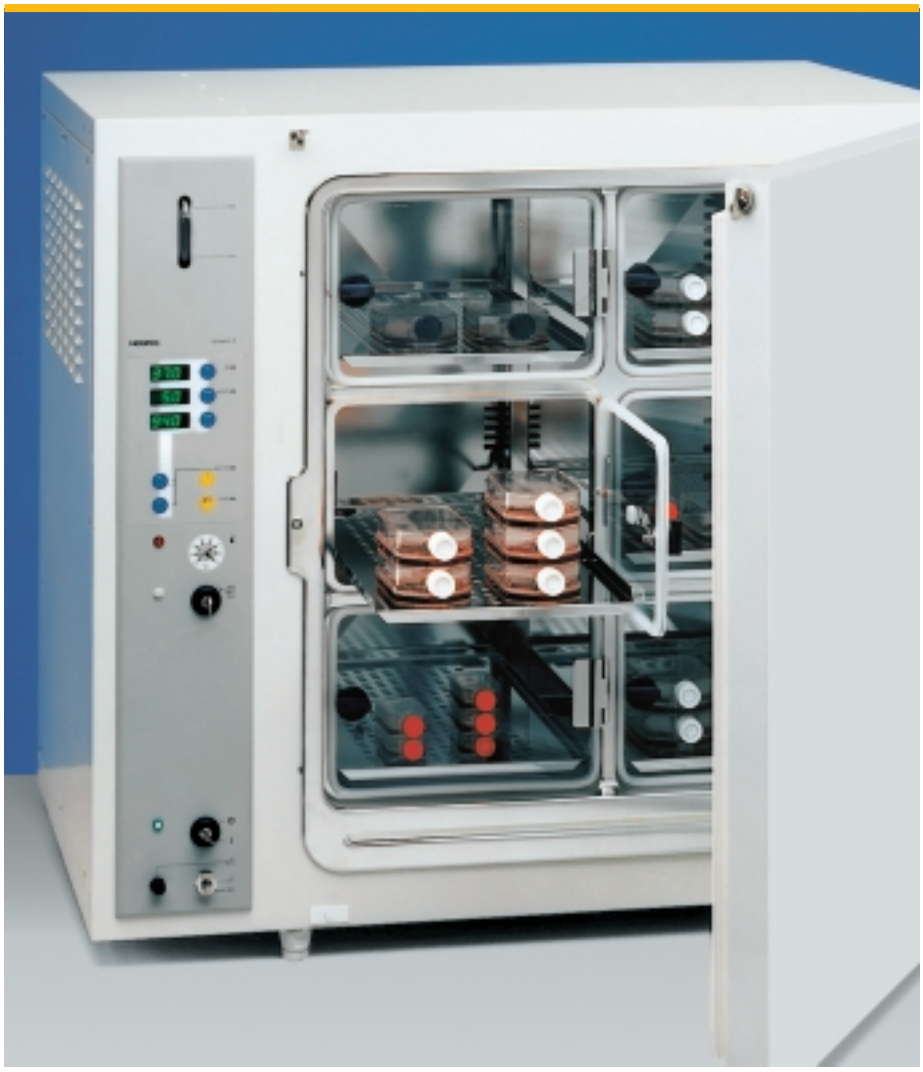
Quality Products – Lifetime Care

Kendro

CYTOPERM® 2 GASSED INCUBATOR – CELL CULTIVATION FOR THE 21ST CENTURY

The Heraeus® gassed incubator cytoperm® 2 offers simple handling, high protection against contamination and safe operation.

Using our experience combined with latest technologies and practice related feedback from our customers, we have developed this unique CO_2 incubator offering 180 °C disinfection.



The ultimate equipment: cytoperm® 2

Applications

cytoperm® 2 meets stringent requirements essential for research in pharmaceutical, cancer, AIDS, vaccine production and IVF fields and other applications involving sensitive or infectious samples.

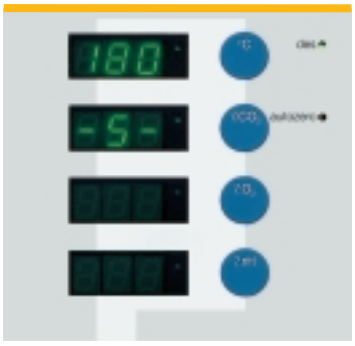
Cells and tissues, which should grow *in vitro*, must find comparable *in vivo* conditions in the cell culture. cytoperm® 2 controls temperature, CO_2 content and relative humidity with exceptional precision to simulate the natural environment of cells. As an option cytoperm® 2 can also control the O_2 concentration.

The incubator's benefits

cytoperm® 2 represents the synergies of safety and reliability for cell and tissue culture applications

- hot air disinfection at 180 °C, including all fittings and sensors
- pyrolytic germ barrier for sterilization of the humidification water
- water reservoir conveniently located outside work space
- humidity control
- thermo jacket heating system

PROTECTION FOR HIGH DEMANDS



Disinfection routine with temperature and status display

Easy to clean interior

Contamination prevention
Contamination by bacteria, viruses, fungal spores and mycoplasmas can destroy valuable cultures or distort test results, causing more work. The cytoperm® 2 gassed incubator's design incorporates measures which avoid or efficiently eliminate contamination. These measures include, for example, the interior's design just like the automatic disinfection routine.

180 °C hot air disinfection
A heating system operating independently of the incubation system raises the temperature of the work space to 180 °C for disinfection. The automatic routine is initiated by a simple key switch and can be repeated as often as required. All fittings and sensors remain inside the incubator during disinfection. A GLP tested laboratory, accredited in accordance with DIN EN 45001, confirms the 180 °C hot air disinfection routine's efficiency.

Test germs to varify the efficiency:
- Bacillus subtilis
- Bacillus stearothermophilus (USP 23)
- Enterococcus faecalis
- Escherichia coli
- Pseudomonas aeruginosa
- Aspergillus niger

Pyrolytic germ barrier
Water for humidification always passes this barrier and is sterilized at 500 °C before entering the incubator. This system reliably prevents spread of contamination.

External water reservoir
The water reservoir of the cytoperm® 2 is located outside the incubation chamber, thus there are no open water surface areas inside the incubator. Combined with the pyrolytic germ barrier, contamination is effectively counteracted.

Gas tight screen
Six individually sealed glass doors which allow segmented access to individual sections of the incubator are provided as standard. This minimises any changes to the atmosphere during opening, shortens recovery times significantly and also further reduces the risk of contamination.

Air jacket heating system
The air jacket heating system maintains constant and stable temperatures on all interior surfaces which ensure a condensation free environment.

IDEAL CULTURE CONDITIONS

Reliable sensors with automatic calibration ensure the long term stability of incubation parameters.

Constant environmental parameters
The cell's environmental conditions change, for example, when the gassed incubator is opened. Permanent control and regulation of the parameters ensure that such changes are detected and the required *in vitro* conditions are re-established in the shortest possible time. This feature ensures the high degree of stability in environmental conditions required for both long and short term cultures.

Temperature control
Temperature is microprocessor controlled with a Pt 100 sensor.

Humidity control
The relative humidity (rH) is controlled with a microprocessor. The maintenance free sensor operates in accordance with the capacitive humidity measuring principle. The water reservoir for humidification is located outside the work space and is easy to fill, empty and monitor.

CO_2 control using auto-zero
CO_2 levels are microprocessor controlled using a thermal conductivity sensor with excellent long term stability and reliability with built-in humidity compensation. A fully automated calibration (auto-zero) is carried out periodically to ensure CO_2 long term stability and thus stable CO_2 levels and a constant pH level in culture media with bicarbonate buffers.

HIGH SAFETY STANDARDS

The cytoperm® 2 offers a number of safety features:

auto-start function
The auto-start function, which considerably simplifies the equipment's operation, contains the incubator's automatic start-up and the measuring systems' calibration. The incubator can be loaded immediately after the start-up routine is completed.

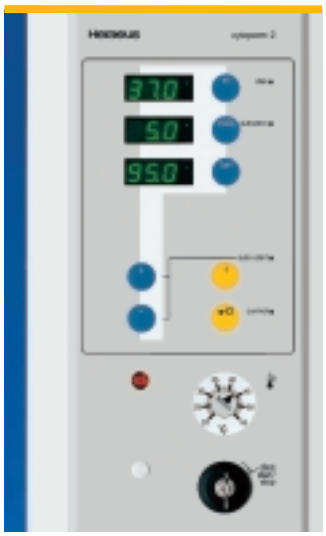
Locking of set values
By locking the set values, unauthorised alterations of the incubation conditions are prevented. Switching the cytoperm® 2 on and off and setting off the disinfection routine is done via a key switch.

Overtemperature protection
A second, totally independent control system with an additional Pt 100 temperature sensor protects samples from overtemperature.

Alarm and error diagnosis
Alarm functions are provided for all control parameters, giving acoustic or visual signals when errors occur. The error diagnosis system identifies malfunctions, which can be queried using the "i" (information) key on the operating panel.

Lockable door
Unauthorised access to samples can be prevented through the lockable door. This feature is particularly important when dealing with hazardous samples or during long term experiments.

Safety during power failure
All operating parameters remain stored in the event of a power failure. When power is restored the unit automatically returns to standard operation and immediately reinstates the set parameters.

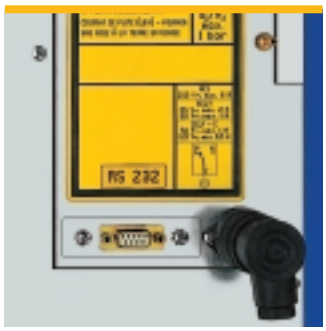


The clear operating panel ensures simple handling

Lockable heated door and water level indicator for the water reservoir

Monitoring and documentation

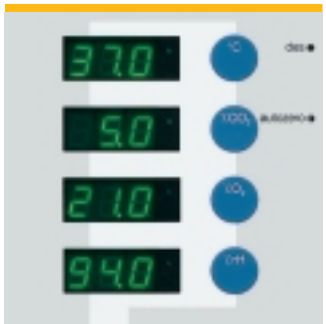
Should any malfunction occur, cytoperm® 2 conveys the information directly to a central monitoring system via a potential free contact. The Heraeus® cytoperm® 2 is equipped with an RS 232 digital interface for monitoring and documentation of the operating parameters. The documentation software comes standard with the cytoperm® 2.



Potential free contact and RS 232 interface

cytoperm® 2 CO_2/O_2

This model has been designed for cell cultivation under physiological and tissue typical oxygen partial pressure conditions. The zirconium oxide sensor for measuring oxygen is maintenance free, can be disinfected at 180 °C and is automatically calibrated (auto-cal). By supplying oxygen or nitrogen, the O_2 content can be controlled from 3–90%.



Operating panel of the cytoperm® 2 with additional O_2-control.

TECHNICAL DATA

Type		Unit	Value/Description
Dimensions			
External casing	(w/h/d)	mm	920 x 855 x 775
Work space	(w/h/d)	mm	607 x 669 x 585
Total volume		l	220
Shelves, two pieces			
Dimensions	(w/d)	mm	260 x 500
No. standard/maximum			6/16
Max. load per shelf/total load per unit		kg	5/30
Access port			
Access port		Ø 20 mm	rear wall bottom left
Material			
Work space and fittings			stainless steel
Start-up			using auto-start routine
Start-up time at 37 °C set temp.		h	ca. 4.5
Disinfection routine			verified by an accredited laboratory
Disinfection temperature on all surface areas		°C/h	180/3
Disinfection routine		h	~12
Efficiency spectrum			bacteria, fungi, spores (USP 23)
Temperature			thermo jacket heating system
Measurement and control range	CO_2 unit	°C	T_A [1] + 5 … 50
	CO_2/O_2 unit	°C	T_A [1] + 7 … 50
spatial[2]/temporal[2][3]			
Temperature deviations		K	≤ ± 0.1/≤ ± 0.5
Heating up time to 37 °C with auto-start[4]		h	approx. 5
Ambient temperature range		°C	18 … 30
Recovery time[5]		min	≤ 3
Humidity			external water reservoir
Controlled, measuring principle		rH	capacitive humidity measurement
Control range		% rH	60 … 95
Control accuracy		% rH	± 1
Recovery time at 95% rH[2]		min	≤ 9
CO_2			TCD
Controlled, measuring principle			thermal conductivity measuring cell with auto-start and auto-zero functions, 180 °C hot air disinfection
Measurement and control range		vol %	0 … 20
Control accuracy		vol %	0.1
Recovery time at 5% CO_2[2]		min	≤ 2
O_2 control (option)			
Controlled, measuring principle			zirconium oxide sensor with auto-cal function
Control range		% O_2	3 … 90
Supply of O_2 for the range		% O_2	> 21 … 90
Supply of N_2 for the range		% O_2	3 … < 21
Control accuracy		% O_2	± 0.5
Recovery time at 7% O_2[2]		min	≤ 15
Electrical data			
Rated voltage		V~	230
Rated power			
incubation operation at 37 °C		kW	1.2
disinfection operation at 180 °C		kW	1.2
Rated frequency		Hz	50/60
Weight (excluding accessories)		kg	107

[1] T_A = ambient temperature
[2] DIN 12880, part 2/11.78
[3] at 37 °C
[4] T_A = 22 °C, incubator empty
[5] at 37 °C, after 30 sec open door, to 98% of the initial value

Your benefits at a glance

- 180 ° disinfection routine
- external water reservoir
- optional O_2-control
- unique warranty and service

ORDER NUMBERS

cytoperm® 2, CO_2	**51011659**
cytoperm® 2, CO_2/O_2	**51011660**

Accessories	
Support frame, height 300 mm	50031348
Support frame, height 780 mm	50029597
Rack to stack two cytoperm® 2	50053628
Additional stainless steel shelf, half width including 2 shelf supports	50029943
Gas cylinder monitor with acoustic signal, 120/230 V~, 50/60 Hz	50046033
CO_2 cylinder pressure regulator	03429937
N_2 cylinder pressure regulator	03429942
O_2 cylinder pressure regulator	03429943

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Australia Kendro Laboratory Products · Lane Cove, Sydney · NSW 2066 · Tel. +61 (2) 9936 1540 · Fax +61 (2) 9427 9765 · info@kendro.com.au
Austria Kendro Laboratory Products GmbH · Vienna · Tel. +43 (1) 801 40-0 · Fax +43 (1) 801 40 40 · office@kendro.at
Canada Kendro Laboratory Products International Sales · Newtown, CT · USA · Tel. 1 (203) 270-2080 · Fax 1 (203) 270-2166 · info@kendro.com
China Kendro Laboratory Products Beijing Rep. Office · Beijing · Tel. +86 (10) 6501-1573 · Fax +86 (10) 6501-4229 · kendrobj@163bj.com
Kendro Laboratory Products (H.K.) Limited · Hong Kong · Tel. +852 2711-3910 · Fax +852 2711-3858 · info@kendro.com
Kendro Laboratory Products Shanghai Rep. Office · Shanghai · Tel. +86 (21) 5490-0216 · Fax +86 (21) 5490-0230 · kendrosh@public4.sta.net.cn
Denmark Kendro Laboratory Products AB · Albertslund · Tel. +45-43 62 46 47 · Fax +45-43 62 46 41 · info@kendro.dk
France Kendro Laboratory Products · Courtaboeuf cedex · Tel. +33 (1) 69 18 77 77 · Fax +33 (1) 60 92 00 34 · info@kendro-lab.fr
Germany Kendro Laboratory Products GmbH · Hanau · Tel +49 (1805) 536 376 · Fax +49 (1805) 112 114 · info@kendro.de
India Kendro Laboratory Products (India) Pvt. Ltd. · New Delhi · Tel. +91 (11) 618 48 40 · Fax +91 (11) 618 53 97 · kendro.india@vsnl.com
Italy AHSI S.p.A. · Cavenago Brianza · Tel. +39 (02) 95 08 11 · Fax +39 (02) 95 08 12 77 · info@ahsi.it
Japan Nippon Kendro Co. Ltd. · Tokyo · Tel. +81 (0) 3 3517-1661 · Fax +81 (0) 3 3517-1664
New Zealand Kendro Laboratory Products Pty Ltd · Auckland · Tel. +64 (9) 525 03 33 · Fax +64 (9) 525 03 37
Poland Kendro Spólka z.o.o. · Warsaw · Tel. +48 (22) 663 43 23 · Fax +48 (22) 663 43 25 · kendro.warszawa@kendro.com.pl
Portugal Heraeus S.A. · Cacem · Tel. +351 (1) 912 08 65 · Fax +351 (1) 912 08 60 · heraeus@mail.telepac.pt
Spain Heraeus S.A. · Madrid · Tel. +34 (91) 358 19 96 · Fax +34 (91) 358 20 67 · laboratorio@heraeus.es
Sweden Kendro Laboratory Products AB · Sollentuna · Tel. +46 (8) 585 777 50 · Fax +46 (8) 623 15 45 · info@kendro.se
Switzerland Kendro Laboratory Products AG · Zurich · Tel. +41 (1) 454 12 12 · Fax +41 (1) 454 12 99 · kendro-ag@swissonline.ch
Kendro Laboratory Products SA · Carouge-Genève · Tel. +41 (22) 343 21 67 · Fax +41 (22) 342 38 31 · kendro-sa@swissonline.ch
U.K./Ireland Kendro Laboratory Products Ltd. · Bishop's Stortford · Herts · Tel. +44 (1279) 827700 · Fax +44 (1279) 827750 · kendro@kendro.co.uk
USA Kendro Laboratory Products · Newtown, CT · Tel. +1 (800) 522-7746 · Fax +1 (203) 270-2166 · info@kendro.com

All other countries in
Asia Pacific North Kendro Laboratory Products (H.K.) Limited · Hong Kong · Tel. +852 2711-3910 · Fax +852 2711-3858 · info@kendro.com
Asia Pacific South Kendro Laboratory Products · Lane Cove, Sydney · NSW 2066 · Tel. +61 (2) 9936 1540 · Fax +61 (2) 9427 9765 · info@kendro.com.au
Europe, Middle East, Africa
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Internet http://www.kendro.com

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