

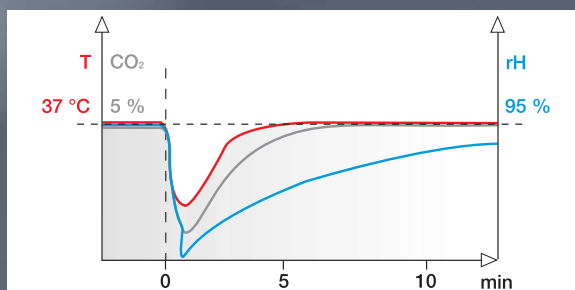


# CB

## CO<sub>2</sub> incubators from the APT.line<sup>®</sup>

Cellular growth, morphology, and cell differentiation are significantly affected by the cellular microenvironment. BINDER's objective is to create an optimal simulation of a nearly natural growth environment. The CO<sub>2</sub> incubators from the APT.line<sup>®</sup> are the ideal solution for all professional users striving to achieve realistic, authentic, and reproducible results.

Apart from finding specific technical solutions, one of the main factors is the ability to simulate the required growth parameters at all times and always simultaneously, irrespective of conditions. In this context, the ability to actively influence parameters plays a decisive role in successfully reproducing natural growth conditions.



High speed simultaneous simulation

# CO<sub>2</sub> incubators from the APT.line®

## Nature sets the standard



### ► Temperature

Temperature is a decisive factor for growth. Strong cell growth can be achieved only within a very narrow tolerance range around the optimal temperature.

**Only from BINDER: the VENTAIR jacket system, precise, dynamic, reliable, and sterile.**

**Precision:** The electronically controlled APT.line®-air jacket system ensures fully homogenous temperature control of the complete interior.

#### **Dynamics:**

BINDER Airflow Design and Intelligent Temperature Control for optimal temperature stability for natural temperature conditions

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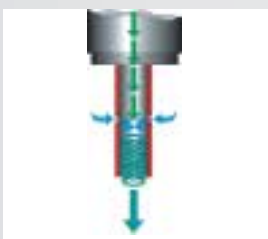
### ► CO<sub>2</sub> content

Traditional nutrient media have a very narrow pH tolerance range, which can be stabilized only by precise and constant CO<sub>2</sub> content.

#### **CO<sub>2</sub> infrared measurement system**

Conventional measurement systems basically measure the CO<sub>2</sub> content as a function of humidity. Both humidity and CO<sub>2</sub> concentration change when the door is opened. Such measurements can be incorrect in real time.

IR measurement technology, which is the professional standard at BINDER, prevents such deviations.



**Performance:** Single-beam differential measurement with a drift-free FPI sensor. Permanent digital CO<sub>2</sub> gas measurement, direct and fast.

Indispensable for precise and fast adjustment of the required CO<sub>2</sub> content.

Result: up to 20 times faster CO<sub>2</sub> content recovery times.

**Time:** This measurement process does not require time-consuming and imprecise auto-zero calibration.

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### ► Humidity

Typically, high saturated air humidity is important. It prevents cell cultures from drying out, and also keeps the osmolarity constant in the culture medium.

#### **The patented Permadyr® system**

The Permadyr® double pan system has a defined condensation point for simple and innovative humidity control.

#### **Performance:**

- High saturated air humidity up to 95 % r.H.
- Stable and humidity final moisture
- Fast humidity build-up throughout the entire interior chamber
- High spatial accuracy

#### **Quality and comfort**

- Rugged system without any sensitive accessories
- Uncomplicated and quick water replacement
- Easy dosage of bactericidal additives
- Constant optical monitoring of water level and water quality



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### ► Sterile operating conditions

The overall technical concept for the CO<sub>2</sub> incubators of the APT.line® was specifically designed for all potential situations, with active and passive protection against contamination. The focus is clearly on the interior chamber and the protection of cultures. This focus actively reduces the risk of procedural failures and financial losses.

#### 1. Sterile incubation conditions

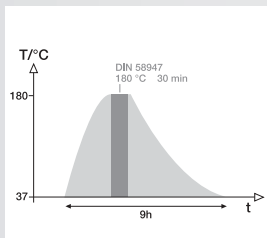
- Only from BINDER: The APT.line® interior. Superior quality deep-drawn stainless steel inner chamber. No seams for particulate matter to accumulate, no leaks. Completely smooth interior walls with large radius corners facilitate easy cleaning.
- Regardless of the protection systems provided, the best protection against uncontrolled penetration of germs or hidden germination sites is the complete elimination of connections into and out of the interior.



#### 2. Germ-free culture processes

Contamination risk must be eliminated, regardless of how the technical growth parameters are achieved.

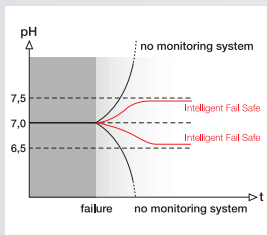
- **This is possible only with Permadyr®:** Exact fulfillment of highly varying requirements for maximum air humidity of up to 95 % r.H. with a completely condensation-free interior. Thanks to the unique adaptable control technology, this can even be achieved under varying ambient temperatures of 18 °C - 32 °C (64 °F - 90 °F).
- **Only from BINDER. Patented gas mixing head.** This actually provides completely homogenous gas distribution without the use of fans to prevent turbulence and mixing of germs in the interior.



#### 3. Hot air sterilization at 180 °C (356 °F) in compliance with standards

- The most reliable and internationally recognized method for ensuring a microbiologically clean environment
- A prerequisite for work in accordance with GLP/GMP standards
- The safety standard for handling infectious and pathogenic material

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### ► Intelligent process monitoring

1. **MCS controller.** The ultimate in precision, communication, and digital data control. High value added for cell growth safety.
2. **World's first. Intelligent Fail Safe.** BINDER has pioneered an effective safety function for CO<sub>2</sub> stability. Even small process-related pH fluctuations are identified. This triggers a safety function that keeps the CO<sub>2</sub> content close to the setpoint. There is no better method to safeguard the cell survival.

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## CB series: CO<sub>2</sub> incubators with hot air sterilization

CO<sub>2</sub> incubators for professional users who need maximum consistency of all growth parameters and completely sterile conditions.



### ► Performance features and equipment:

- Electronically controlled APT.line® preheating chamber technology
- Temperature range of 7 °C (13 °F) above ambient temperature up to 60 °C (140 °F)
- MCS controller for temperature and CO<sub>2</sub> concentration
- User-friendly LCD screen
- Easy-to-read menu guide
- Integrated electronic chart recorder
- Variety of options for the graphic display of process parameters
- Real-time clock
- Standard-compliant hot-air sterilization at 180 °C (356 °F) (DIN 58947)
- VENTAIR jacket system
- Drift free infrared CO<sub>2</sub> measurement system
- Gas mixing head
- Weldless deep-drawn inner chamber made of stainless steel Mat. No. 1.4301 (V2A) / AISI 304 or copper
- Permadyr® system, condensation-free double-pan humidification system
- Electronic self-diagnostic system for errors with optical and acoustic alarm, as well as relay contact for central monitoring
- Independent adjustable temperature safety device, Class 3.1 (DIN 12880) with visual and acoustic temperature alarm
- Tightly closing inner glass door
- RS 422 interface for communication software APT-COM® DataControlSystem
- 3 perforated shelves made of stainless steel Mat. No. 1.4301 (V2A) / AISI 304 or copper (in standard and O<sub>2</sub>-control versions)



## Technical specification CB series



	CB 150	CB 210
<b>▶ Exterior dimensions</b>		
Width (mm/inch)	680 / 26.8	740 / 29.1
Height (incl. feet/roller) (mm/inch)	919 / 36.2	1069 / 42.1
Depth (plus 55 mm (2.17 in.) for instrument panel) (mm/in.)	722 / 28.4	722 / 28.4
Wall clearance (mm/inch)	50 / 2.0	50 / 2.0
<b>▶ Interior dimensions</b>		
Width (mm/inch)	500 / 19.7	560 / 22.1
Height (mm/inch)	600 / 23.6	750 / 29.5
Depth (mm/inch)	500 / 19.7	500 / 19.7
Interior volume (l/cu.ft.)	150 / 5.4	210 / 7.5
Perforated shelves, stainless steel (number standard/max.)	3 / 8	3 / 11
Dimensions of perforated shelves, Width (mm/inch)	473 / 18.6	533 / 21.0
Depth (mm/inch)	448 / 17.6	448 / 17.6
Weight (empty) (kg/lbs.)	107 / 236	121 / 267
<b>▶ Temperature data</b>		
Temperature range		
7 °C (13 °F) above ambient up to °C/°F	60 / 140	60 / 140
Temperature variation at 37 °C (98.6 °F) (± °C)	0.3	0.4
Temperature fluctuation (± °C)	0.1	0.1
Recovery time after door was opened for 30 sec. <sup>1)</sup>		
at 37 °C (98.6 °F) (Min.)	3	3
CO <sub>2</sub> -range (Vol.-% CO <sub>2</sub> )	0–20	0–20
Setting accuracy (Vol.-% CO <sub>2</sub> )	0.1	0.1
Recovery time after door was opened for 30 sec. <sup>1)</sup>		
up to 5 vol. % (min)	6	6
CO <sub>2</sub> -measurement	IR	IR
Hose connectors for CO <sub>2</sub> (mm/inch)	6 / 0.24	6 / 0.24
Humidity (constant) (% r.H.)	95	95
<b>▶ Electrical data</b>		
Housing protection acc. to EN 60529	IP 20	IP 20
Nominal voltage (±10 %) 50/60 Hz (V)	230 / 115	230 / 115
Nominal power (W)	1400	1600
Energy consumption at 37 °C (98.6 °F) (W)	140	140
O <sub>2</sub> -range (Vol.-% O <sub>2</sub> )	0.2–95	0.2–95
Setting accuracy (Vol.-% O <sub>2</sub> )	0.1	0.1
Recovery time <sup>1)</sup>		
from 20 vol % up to 0.2 vol % O <sub>2</sub> (Min.)	120	120
from 20 vol % up to 5 vol % O <sub>2</sub> (Min.)	64	64
from 20 vol % up to 10 vol % O <sub>2</sub> (Min.)	31	31
from 20 vol % up to 15 vol % O <sub>2</sub> (Min.)	14	14
from 20 vol % up to 30 vol % O <sub>2</sub> (Min.)	7	7
from 20 vol % up to 50 vol % O <sub>2</sub> (Min.)	25	25
from 20 vol % up to 80 vol % O <sub>2</sub> (Min.)	75	75
O <sub>2</sub> -measurement	ZrO <sub>2</sub>	ZrO <sub>2</sub>
Hose connectors for O <sub>2</sub> /N <sub>2</sub> (mm/inch)	6 / 0.24	6 / 0.24

<sup>1)</sup> up to 98 % of the set value

All technical specification are specified for units with standard equipment at an ambient temperature of +25 °C (77 °F) and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to DIN 12880, part 2 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

## Options/accessories CB series



► **Trigas model with O<sub>2</sub> control for variable O<sub>2</sub> values**

This adjustment is performed with an additional control circuit by controlled feeding of oxygen and/or nitrogen for hyperoxic or hypoxic culture conditions. Measurement is performed with a zirconium oxide sensor (ZrO<sub>2</sub>).

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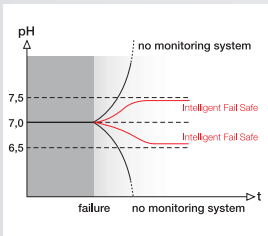


► **Gas-tight, divided inner glass door**

Maintains consistent climatic conditions within the incubator. Minimal loss of incubator atmosphere, heat and, CO<sub>2</sub> during loading, as well as fast recovery times.

(CB 150: 4 doors, CB 210: 6 doors)

CB



► **Intelligent Fail Safe**

Electronic safety system for the independent monitoring of the CO<sub>2</sub> adjustment in the incubator. When tolerance limits are exceeded, the Intelligent Fail Safe system automatically takes over control of the CO<sub>2</sub> concentration.

CB



► **Modular expandable roller bottle system**

The system is used for the cultivation of adherent cells and suspension cultures.

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► **CTM 01 measuring unit for CO<sub>2</sub> concentration and temperature**

Universally usable, portable measuring unit for precise determination of CO<sub>2</sub> concentration and temperature.

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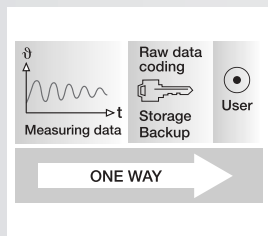


► **Cleaning kit**

Special cleaning kit:

1. Mild cleaner for stainless steel to provide long-term protection
2. Clinically approved disinfectant
3. Cleaning cloths

CB



► **APT-COM® DataControlSystem GLP Edition**

Software for GLP-compliant control, programming, and documentation. Permits networking of up to 30 units or controllers. Complies with FDA 21 CFR Part 11 requirements.

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**CB**

	150	210
CO <sub>2</sub> -incubator with O <sub>2</sub> control, Inner chamber stainless steel	<input type="radio"/>	<input type="radio"/>
CO <sub>2</sub> -incubator with gastight, divided inner glass door and divided shelves*	<input type="radio"/>	<input type="radio"/>
CO <sub>2</sub> -incubator with O <sub>2</sub> control with gastight, divided inner glass door and divided shelves*	<input type="radio"/>	<input type="radio"/>
Shelf, perforated, stainless steel or cooper	<input type="radio"/>	<input type="radio"/>
Divided shelf for divided inner glass door, stainless steel or cooper	<input type="radio"/>	<input type="radio"/>
Divided inner glass door (4 doors) with 2 divided shelves, cooper or stainless steel	<input type="radio"/>	–
Divided inner glass door (6 doors) with 3 divided shelves, cooper or stainless steel	–	<input type="radio"/>
Looking of controller keyboard	<input type="radio"/>	<input type="radio"/>
CO <sub>2</sub> bottle changer for connecting two gas cylinders with alarm messaging and incident reporting	<input type="radio"/>	<input type="radio"/>
Additional O <sub>2</sub> control	<input type="radio"/>	<input type="radio"/>
CO <sub>2</sub> bottle changer for connecting two gas cylinders with external connection for up to one additional CO <sub>2</sub> incubator with alarm messaging and incident reporting	<input type="radio"/>	<input type="radio"/>
O <sub>2</sub> and N <sub>2</sub> bottle changer for connecting two cylinders of either gas (Attention: Only in combination with O <sub>2</sub> control!)	<input type="radio"/>	<input type="radio"/>
Connection kit for CO <sub>2</sub> , O <sub>2</sub> or N <sub>2</sub> , consisting of a bootle pressure regulator, max. pressure 10 bar (145 psi) with connection parts, and a 5 m (16 ft.) hose	<input type="radio"/>	<input type="radio"/>
Interior LEMO socket (with cover) with LEMO plug (max. power rating 230 V AC, 3A)	<input type="radio"/>	<input type="radio"/>
CELLROLL set. Modular, expandable roller bottle system for cell cultivation. Complete set consisting of: motor drive, connection cables, low voltage connection (8-pin) (max. 24 V AC, 2A)	<input type="radio"/>	<input type="radio"/>
Stacking adapter for direct thermal decoupled stacking of 2 CB incubators	<input type="radio"/>	<input type="radio"/>
Stacking frame for 2 CB incubators on castors with brakes	<input type="radio"/>	<input type="radio"/>
Analog output 4–20 mA for temperature and CO <sub>2</sub> , with 6-pin DIN socket (output not adjustable)	<input type="radio"/>	<input type="radio"/>
Independent electronic safety system Intelligent Fail Safe. Unique safety plus for continous monitoring of the CO <sub>2</sub> control, preventing any unnoticed deviations of the CO <sub>2</sub> concentration form set point. (Attention: Only available for models with stainless steel interior! Not available in conjunction with O <sub>2</sub> control!)	<input type="radio"/>	<input type="radio"/>
Calibration certificate for temperature and CO <sub>2</sub> /O <sub>2</sub> . Temperature measurement in center/calibration with analyzed test gas (5 % CO <sub>2</sub> / 80 % O <sub>2</sub> )	<input type="radio"/>	<input type="radio"/>
Cleaning kit for cleaning and disinfection	<input type="radio"/>	<input type="radio"/>
Manual for Primary Human Cell Culture	<input type="radio"/>	<input type="radio"/>

\* CB 150 I with 2 shelf levels and 2 divided shelves, CB 210 I with 3 shelf levels and 3 divided shelves

option – not available

Technical specifications subject to change