# ReCO<sub>2</sub>ver

## Absolute *precision.* Maximum *protection.*







# Constant, ideal environment for optimal cell growth

RECO<sub>2</sub>VER<sup>™</sup> **Rapid Recovery Incubator** 

The fastest and most precise recovery rates of cell culture conditions available. At Baker, it is our job to deliver optimal "Environments for Science<sup>™</sup>".

Our ReCO₂ver<sup>™</sup> and ReCO₂ver<sup>™</sup> Plus incubators have been designed with that in mind, providing precision control over the environmental conditions your cells require to thrive while delivering unprecedented recovery over those conditions after they have been interrupted.

Why? Because your work depends on it!

In all scientific research applications, each cell type will benefit from keeping proper physiological cell growth conditions.

Cell culture incubators attempt to mimic physiological conditions, but atmospheric conditions within the laboratory and the environmental parameters incubators attempt to control and are lost with each door opening taking a long time to get back to the growth conditions your work is dependent on. This will impact the integrity of your work.

There are several factors an incubator should control in order to help you achieve optimal cell growth conditions. Precision in temperature, gas and humidity as well as the rapid recovery of those conditions after door openings are crucial for ensuring cells are exposed to a constant environment required for their well-being. These parameters can change very quickly once a door is opened, and it can take a long time for in vivo-like conditions to be achieved again.

# Achieve optimal with your rapid recovery incubator

#### **FEATURES**

- Control over temperature, carbon dioxide & relative humidity
- Recovery of cell culture conditions
- Protection for cells
- ISO Class 4 (class 10) air cleanliness
- Rapid recovery rates
- Prevention & contamination control
- Precise & accurate performance





#### **CONSTANT IDEAL ENVIRONMENT** FOR OPTIMAL CELL GROWTH

#### • BE MORE PRODUCTIVE

Large usable workspace, com with proprietary technology

User driven features and ultra humidification helps increase throughout by solving comm problems and eliminating tec water pan changes. When combining a large interior us workspace with active humid control & our effectively tuned biodecontamination protoco productivity is greatly improv

#### • FLEXIBLE AND VERSATILE

Determine what level of prote or control your work requires

User-defined configurations plenty of options and access that allow you to determine t level of control and protection research requires.

#### EXPLORE MORE QUESTION

Find out how cells respond in challenging conditions

Work with sensitive cell lines. ReCO<sub>2</sub>ver<sup>™</sup> and ReCO<sub>2</sub>ver<sup>™</sup> Plu can provide the unique cond required to explore more rese questions than ever before.

	IMPROVE VALIDITY
nbined	& RELIABILITY
	Accurate, precise, and stable
sonic	environmental conditions
on lious eable ity d , ed.	With full, finely-tuned control over three variables (CO <sub>2</sub> , temperature and relative humidity), you can create more lifelike conditions for your cell cultures to thrive, and improve the validity of your results. Accurate, precise and stable environmental conditions make your results more reproducible.
ction	PROTECT PRECIOUS  CELL CULTURES
vith	Provide unparalleled protection of your work
ories ne n your	Whether growing a few plates of microorganisms for a small laboratory or managing a large-scale tissue
IS	hinges on how well your incubator prevents contamination. ReCO <sub>2</sub> ver <sup>™</sup> and ReCO <sub>2</sub> ver <sup>™</sup> Plus draw on Baker's deep knowledge of gir containment
With s, you tions arch	and contamination control technologies to provide unparalleled protection of your work.

# Unmatched control and accuracy

Optimal growth conditions

ReCO<sub>2</sub>ver<sup>™</sup> provides users with precise, rapid control, as well as industry-leading stability, uniformity and recovery rates. Even with a full load, cell cultures grow consistently from shelf to shelf, for dependably high-quality, robust cells on every plate.

InteliCELL<sup>m</sup> proprietary PID control algorithm provides pinpoint, user-defined control over all three parameters (temperature, CO<sub>2</sub> and relative humidity), with an incredibly fast recovery not seen in other CO<sub>2</sub> incubators.

Uniform vertical downflow air circulation enhances the uniformity and stability of conditions inside the chamber without disturbing or dehydrating cell cultures.





# Protect cells from contamination

#### Optimal contamination prevention and control

At Baker, we know how to prevent and control contamination. We're leaders in the design and development of contamination control technology, innovating solutions in biosafety and biocontainment for more than 70 years. Our ReCO2ver<sup>™</sup> design draws on this extensive experience to protect precious cultures against the threat of contamination from a wide variety of sources, for a wide variety of scientific applications.

#### Baker Clean Air Technology

Uniform downward airflow inside ReCO₂ver<sup>™</sup>.

Air flows down to the chamber bottom, under the false floor, passing over the humidity source. The fan pulls air tap behind the rear baffle to the top of the unit, where it passes through a full-face HEPA filter, delivering clean, better-than-ISO Class 4 (Class 10) air.



Right side view

Feature	Benefit
Vertical, downward airflow	Delivers better-than ISO Class 4 (Class 10) air to the chamber, keeping cultures safe from contaminants by sweeping them away and trapping them in the full-face HEPA filter. This uniform downflow also helps reduce variations in temperature throughout the chamber, without drying out sensitive cultures
Large, full-face HEPA filter	Captures contaminants introduced into the chamber after door opens. ReCO2ver <sup>™</sup> takes less than 2 minutes to provide better-than-ISO Class 4 (Class 10) air – the fastest filtering rate of any incubator model
Crevice-free interior with coved corners	Easy to clean and won't harbor potential contaminants
Fogless interior door with heated frame	Provides a crystal-clear view to every shelf, reducing the need for door openings, when contaminants are most likely to enter the chamber
Superior condensation control	Eliminates wet spots where contaminants can grow and spread
Ultrasonic humidity delivery system	Eliminates the water pan altogether, along with the risk of contaminants that typically go with it
H <sub>2</sub> O <sub>2</sub> Biodecon Method	Enhances productivity (<4hrs) and provides an effective kill rate (6 log reduction)
Direct heat	Rapid recovery of temperature back to set point



#### A DIFFERENCE YOU CAN SEE



Watch how ReCO₂ver<sup>™</sup>'s air filtration system performs against a leading competitor!

#### INTELICELL<sup>™</sup> - MEET YOUR **INCUBATOR'S BRAIN**

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InteliCELL<sup>™</sup> is the sophisticated, proprietary PID control algorithm that allows you to define and sustain the optimal conditions for your work. It's beyond smart technology – it's the intelligence that drives ReCO<sub>2</sub>ver<sup>™</sup>'s unparalleled control, stability and uniformity. By accounting for factors that other technologies leave as unknown, InteliCELL<sup>™</sup> consistently maintains the set points that you define, giving you ultimate control with minimal effort.

The core of InteliCELL<sup>™</sup>'s design is a closed feedback loop that works just like your nervous system, sensing and responding to changing conditions in a controlled way.

Highly precise temperature, CO<sub>2</sub> and humidity sensors continuously sample interior conditions, feeding data back to the control algorithm. InteliCELL<sup>™</sup> evaluates this data and instantly responds by making small, controlled adjustments to maintain set points. This feedback loop allows ReCO<sub>2</sub>ver<sup>™</sup> to provide consistent conditions even across different ambient laboratory environments. InteliCELL™ is also self-tuning and adaptable to changing laboratory environments and usage rates.

With all that it does for your cell cultures, InteliCELL<sup>™</sup> truly is the brain behind ReCO<sub>2</sub>ver<sup>™</sup>.



#### RH RECOVERY

















# Active humidity and condensation control

Precision control over temperature, carbon dioxide & relative humidity

No gimmicks. Most  $CO_2$  incubators only allow users to control two variables (temperature and  $CO_2$ ) and employ clever gimmicks for passively managing condensation formation. True active humidity and condensation control gives users the ability to define relative humidity in a simple, two-touch process.

At Baker, we know that temperature, CO<sub>2</sub> and relative humidity (RH) are each vital to providing optimal environmental conditions for cell growth.

Our unique PID control algorithm, InteliCELL<sup>™</sup>, combined with highly precise sensor technology, allows  $ReCO_2ver^{m}$  to actively and quickly control humidity and prevent condensation from forming, even at higher levels of RH (>90%).

To learn more about how Baker delivers active humidity and condensation control under typical (up to 90%) and higher (90%-95%) levels of humidity, download our white paper.



Download the relative humidity white paper!



# Simple operation with customizable control

All operations are accessible through an intuitive, user-friendly touchscreen interface that gives you full control over incubator functionality.



#### EASY TO USE & INTUITIVE



- Pressure-sensitive touchscreen works
  with gloved hands
- Real-time status updates and alarm conditions on the home screen
- One-touch access to set point screens
- Customizable alarms and security settings
- Graphic data log displays for at-a-glance monitoring
- USB download of data and event logs
- Helps assist in providing compliance with 21 CFR Part 11 electronic record-keeping requirements

## Eliminate the "Edge Effect", save money for your lab

The "Edge Effect" has been plaguing researchers for far too long, forcing them to use 60% - or accepting the limitations –of a 96 well plate. Passive and imprecise humidity control experienced in most incubators result in the uneven evaporation of culture media among the outer and inner ring of wells in a microtiter or multi well culture plate. Due to tightly controlled humidity modes and the quick recovery of cell culture conditions, ReCO<sub>2</sub>ver<sup>™</sup> incubators have been proven to virtually eliminate this phenomenon within 96 and 384 well plates. In addition to protecting sensitive cell cultures, this technology will save time and money for most laboratories while increasing their productivity!

#### Loss due to Edge Effect: Basic usage

		% plate used	# plates	\$ saved (plates)	Time imaged	\$ saved (image free)	Savings per year <b>per researcher</b>
Basic	96 well	62%	10	-	10hr	-	-
	384 well	60%	5	-	5hr	-	-
ReCO₂ver <sup>™</sup>	96 well	100%	7	\$15.03	6.25	\$150.00	\$8251.50
	384 well	80%	4	\$11.78	3.77hr	\$49.20	\$3049.00

#### Loss due to Edge Effect: Small screening lab

20 plate screen in 96 well plates, 4 screens per year

	% plate used	# plates	\$ saved (plates)	Time imaged	\$ saved (image free)	Savings per year
Basic	62%	20	-	20hr	-	-
ReCO₂ver <sup>™</sup>	100%	13	\$35.07	12.5hr	\$500.00	\$2140.28

\*Assuming: Imaging facility fees = \$40/hour, and tissue culture treated microtiter plates.

#### THE EDGE EFFECT

In this example, the outer ring of a 96 well plate (red) experiences > than 80% in evaporative media loss within each well; the inside 60 wells ("Inner 60") shown here in yellow and green become more viable, yet will still experience evaporative loss of up to 50%.

#### 96 - WELL 100µL MEDIA CALCULATED RECENT LOSS

The percent loss is color coded as per the loss indicator below. (A) shows the Edge Effect in a Basic Waterpan Incubator and (B) shows no evaporation effects in a  $ReCO_2ver^{M}$  incubator.





0-10%	10-20%	20-30%			70-80%	80-90%	90-100%

# Control & kill microbial contaminants with UV and Hydrogen Peroxide

ReCO<sub>2</sub>ver<sup>™</sup> offers two protocols designed to reduce the spread of potential contaminants and to kill a wide variety of contaminating microorganisms.

Customizable UV light and optional biodecontamination cycler offers more effective decontamination of microbes that may grow in the internal water reservoir. A customizable timer allows you to follow your institution's protocols. Vaporized hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) biodecontamination kills a wide variety of microorganisms within the entire chamber. Because  $\text{ReCO}_2 \text{ver}^{\text{M}}$  Plus'  $\text{H}_2\text{O}_2$  protocol is completed within 4 hours (vs. 12 hours for high temperature methods), you'll experience far less downtime than is typically required by most methods of decontamination, increasing the productivity of your laboratory. All removable interior components are autoclavable.



#### H<sub>2</sub>O<sub>2</sub> VAPOR: FOR EFFECTIVE BIODECONTAMINATION

Decontaminating methods are often evaluated based on their ability to achieve a log reduction in the number of microorganisms that can potentially contaminate precious cell cultures. The greater amount of contaminates removed, the safer your cell cultures become.

At Baker, we strive to achieve the maximum amount of protection for your research. In combination with the full face HEPA filter and standard UV light, the vaporized  $H_2O_2$ biodecontamination protocol for  $ReCO_2ver^{M}$ Plus has been developed to prove effective and fast biodecontamination of your incubator.



See our test report on the research and testing behind  $ReCO_2ver^{M}$  Plus  $H_2O_2$  biodecontamination protocol

Compared with other methods that employ high temperatures, directed UV light or ineffective concentrations of vaporized H<sub>2</sub>O<sub>2</sub>, the ReCO<sub>2</sub>ver<sup>™</sup> Plus protocol provides a more effective means of killing more forms of microbial life, including vegetative bacteria, bacterial spores, fungi, fungal spores and viruses.



Average peak hydrogen peroxide concentration (ppm) shown with required concentrations to kill bacteria, fungus and mycoplasma.



Average hydrogen peroxide concentration (ppm) over time throughout the biodecontamination protocol highlighting the different phases: warm up, nebulization, destruction, and fan off.

## Improved productivity and user experience

#### Rapid productivity

ReCO₂ver<sup>™</sup> has been designed around your needs, to help solve common problems and improve productivity in your laboratory.

#### FEATURES

#### FOGLESS INTERIOR DOOR

The difference is clear – the solution was simple. ReCO<sub>2</sub>ver<sup>™</sup>'s heated interior door (controlled by InteliCELL<sup>™</sup>) eliminates condensation on the glass door that obstructs a clear view into the chamber. Now you can see what is happening with your cell cultures without opening the door – every time.

#### • UNIFORM GROWTH CONDITIONS Leave the sweet spot behind.

Featuring one of the largest usable workspace among incubators this size, ReCO₂ver<sup>™</sup> delivers uniform and-stable downflow air throughout the entire chamber. This eliminates your need to find the 'sweet spot' of the incubator, where conditions are believed to be most favorable for cell growth. Cell cultures grow consistently throughout the entire chamber – even next to the door.

### OUTSTANDING CONDENSATION CONTROL

ReCO₂ver<sup>™</sup> is the only incubator available that provides a virtually condensation-free interior at relative humidity levels above 90%. No more time spent mopping up after dripping doors.

Personnel are protected from exposure to potentially dangerous contaminants during cleanup, as well as accidental slips.

#### • MOVE BEYOND THE WATER PAN

Ultrasonic humidification technology (nebulizer delivery system) ReCO₂ver™ eliminates the need for a water pan, freeing your time typically spent on tedious water changes for more productive activities.



#### STANDARD FEATURES AND OPTIONS

ReCO₂ver<sup>™</sup> includes standard features and options designed to enhance your research.

- Auto water refill allows easy water replenishment and changes without opening the door. The exterior water reservoir is easy to monitor and fill, taking only a few minutes every 1-2 weeks.
- USB flash drive and alarm status relay provides for easy extraction of key data and integrates with your facility's monitoring system.
- UV to protect internal water reservoir from contamination.
- Standard alarm contacts and optional communication interfaces (analog 4-20mA signal and RS485/422 and RS232 serial ports) make ReCO₂ver<sup>™</sup> adaptable for various facility monitoring requirements.
- Onboard UV and optional H<sub>2</sub>O<sub>2</sub> biodecontamination provide flexibility to destroy a wide variety of contaminants that infiltrate your laboratory.



Spacious interior shelves hold up to 25 stacks of 90mm plates to help you maximize space.

	ReCC	2ver™	ReCO <sub>2</sub> ve	er™ Plus			
Performance Specifications							
Model Number	REC	2 -Plus					
Humidity Delivery	Ultrasonic (Nebulizer)						
Heat Type		Direct	t Heat				
External Dimensions	26.9″ W x 2	26.5″ D x 40.5″ H (683r	mm W x 673mm D x 10	)29mm H)			
Internal Dimensions	19.9″ W x 21.9″ D	x 33.5″ H (505mm W	x 556mm D x 851mm	H) (239 Litres)			
Usable Interior Volume / Capacity		5.92 ft3 (0.168 m3)	/ 275 90mm plates				
Usable Shelf Area / Max Shelves	18.6″ W x 20	.1″ D (472mm W x 511ı	mm D) / 12 shelves (4	standard)			
Weight	250	lbs. (114 kg.) / Shippir	ng Weight 310 lbs. (141	kg)			
Environmental Performance							
Temperature Control Range	13ºF (7.0ºC) ab	ove ambient - 131ºF (	55.0°C) (increments o	of 0.2°F / 0.1°C)			
Temperature Accuracy		+/-0	0.1°C				
Temperature Uniformity		+/- 0	.25°C				
Temperature Recovery Time		Within 1°C of set poin	t (37°C) in 6 minutes				
CO <sub>2</sub> Control Range		0.0% - 20.0% (inc	crements of 0.1%)				
CO <sub>2</sub> Accuracy	+/-0.15% (the $CO_2$ sensor is a non-dispersive infrared sensor)						
CO <sub>2</sub> Recovery Time	Within 0.2% of set point (5%) in 5 minutes						
Contamination Control							
Relative Humidity Control Range	Two operating modes: Up to 90%; 90%-95%						
Relative Humidity Accuracy	+/-3%						
Relative Humidity Recovery Time	Within 3% of set point (90%) in 4 minutes						
Contamination Prevention	Expansive HEPA filter providing better-than-ISO Class 4 (Class 10) air cleanliness						
Biodecontamination Methods	UVI	ight	UV Light & H <sub>2</sub> 0	2 (Standard)			
	ReCC	2ver™	ReCO₂ver™ Plus				
Features	Standard	Optional	Standard	Optional			
HEPA Filtration (better than ISO Class 4)	~		~				
Active Humidity Control	~		~				
Active Temperature Control	~		~				
Active CO <sub>2</sub> Control	~		~				
Alarm Contacts	~		~				
UV Light	~		~				
Automatic Water Refill System	~		~				
Direct Heat (rapid recovery of temperature back to set point)	~		~				
H <sub>2</sub> 0 <sub>2</sub> Biodecontamination		~	~				
Copper Interior Components		~		~			
CO <sub>2</sub> Supply Automatic Switchover		~		~			
R\$232/485 or 4-20mA		~		~			

#### ACCESSORIES

• Rolling Cart

- Stacking Kit
- CondoCell<sup>®</sup> Starter & Add-on Kits
- Additional Shelves
  (7 additional, 12 max)
- Two-Stage CO<sub>2</sub> Gas Tank Regulator (adjustable to max of 15 psi)
- Portable CO<sub>2</sub> Meter
  & Portable pH Meter
- CO<sub>2</sub> Analyzer Fyrite<sup>®</sup> Kit
- Refill CO<sub>2</sub> Analyzer Fluid Kit
- Seismic Restraints
- Preventive Maintenance Kit
- Dry In-Line Filter



#### ADDITIONAL EQUIPMENT COMPATIBILITY



#### CondoCell®

Portable device that allows transport from/to the incubator while maintaining the cell culture environment.



#### Etaluma Lumascope

Live cell imaging.



#### **PhO<sub>2</sub>x Box**

Cell Culture Chamber with  $CO_2$  and  $O_2$  control.

# **B** Baker



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