

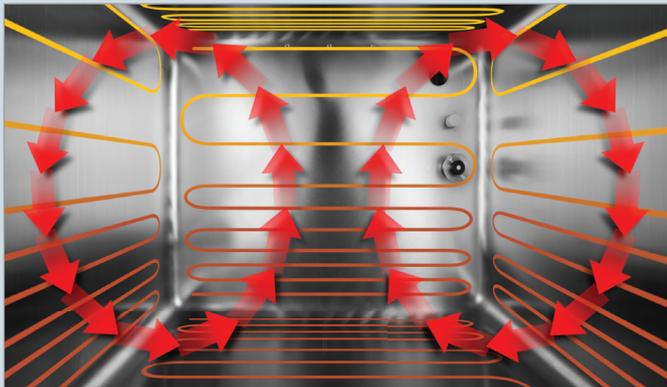
# The Perfect Incubation Environment

## A legacy of innovation

Since their introduction over twenty years ago, Galaxy CO<sub>2</sub> Incubators have become a mainstay in cell culture laboratories all over the world. They set the standard for advanced features and are designed to meet real world needs. They were first to use a fan-less design, direct heating technology and a seamless chamber. Time and again, features like these have helped to improve laboratory processes and cell culture results.

Through continual improvement, Eppendorf offers more features and options than ever before on the Galaxy and New Brunswick models. They are ideally suited for virtually any cell culture application. Consistent temperature and CO<sub>2</sub> stability create the perfect incubation conditions, while features such as the seamless chamber make them easy to clean and ensure a contamination-free environment.

For best-in-class performance, support, and durability, choose Eppendorf CO<sub>2</sub> Incubators.



Gentle convection circulation of the chamber atmosphere maintains stable temperatures and CO<sub>2</sub> control throughout the chamber

## Uniform heating

Five temperature sensors each were placed on the topmost (shelf one) and bottommost shelves (shelf four) of a Galaxy 170 R. The incubator chamber was set to 37 °C. The graph (right) represents the average temperature for each group of sensors over 3.5 hours. The lowest temperature reported by a sensor was 36.77 °C, the highest temperature was 37.15 °C

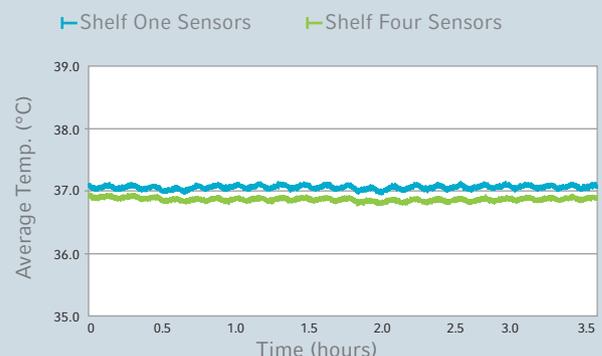
## Direct-heating technology

At the heart of every Eppendorf CO<sub>2</sub> Incubator is its six-sided direct-heating profile. Unlike traditional forced-air culture systems, this design protects against wide fluctuations in temperature and CO<sub>2</sub> that stress cells. No fan is required, which eliminates a classic source of contamination, disturbing vibrations, and costly HEPA filters.

## Infrared (IR) CO<sub>2</sub> Sensor optimizes CO<sub>2</sub> control

The IR sensor provides specific measurement and accurate control of CO<sub>2</sub> levels, unlike traditional TC sensors that are sensitive to chamber humidity and temperature fluctuations. It can also remain in the chamber during high-temperature disinfection.

## Temperature Uniformity at 37 °C



Performance tests conducted by Eppendorf in April 2014 using a Galaxy 170 R CO<sub>2</sub> Incubator.

# Designed with Sample Safety in Mind

## High Temperature Disinfection (HTD)

The HTD feature heats the internal chamber to 120 °C and holds it for 4 hours to effectively eliminate contaminants. This is a standard feature on Model S41i and a factory-installed option on Galaxy models.

## Tightly sealed inner glass door and viewing window

Samples can be viewed during cell culturing without compromising the sample or environment. Since the chamber remains closed, costly CO<sub>2</sub> and N<sub>2</sub> consumption is also reduced.



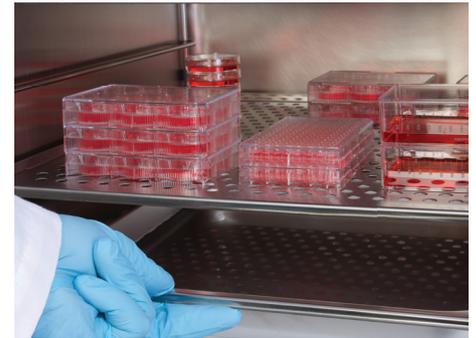
### Easy-to-clean incubator chamber

Deep-drawn chamber with rounded corners and a smooth, seamless surface makes it easy to clean; chamber can be disassembled in less than 2 minutes



### Perforated shelves

Ensure rapid recovery of temperature, CO<sub>2</sub> and RH when the door is opened and closed. Standard on all models

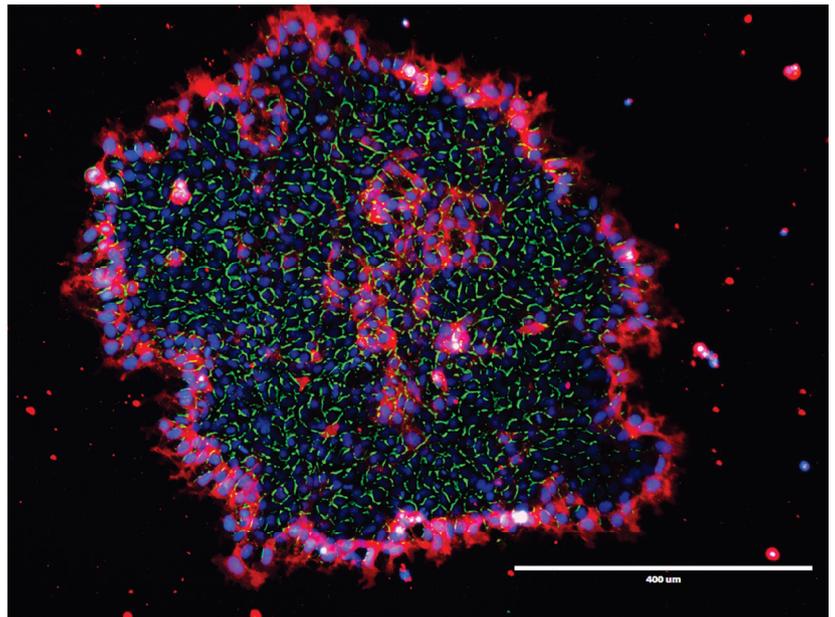


### Removable humidity pan and shelves

Humidity pan and shelves slide out for fast, easy and effective cleaning. Shelves can also be easily repositioned

## Additional features

- > Building Management System (BMS) Relay for integration into centralized building alarm system is standard on all models
- > Advanced control maintains temperature accuracy and uniformity while minimizing costly gas consumption
- > Programmable auto-zero port with hydrophobic filter ensures accurate CO<sub>2</sub> calibration measurements; exceptional filtration rate of 99.999 % prevents particles from entering the sensor or chamber
- > 25 mm Access Port for adding instrumentation or probes
- > High quality door gasket maintains a leak-free seal
- > RS-232 (Galaxy models) or Ethernet port (Model S41i) for communication and external instrument logging
- > In-line filters (0.027 μ) for gas supply inlets ensure sterility
- > Space-saving stackable (x2) design; requires optional stacking stand



Colony of induced pluripotent stem cells (iPSCs) grown in a New Brunswick S41i CO<sub>2</sub> Incubator Shaker by Eppendorf R&D Laboratory in Enfield, CT, USA



# Galaxy<sup>®</sup> CO<sub>2</sub> Incubators

Galaxy models include all standard Eppendorf CO<sub>2</sub> Incubator features (see pages 4 and 5) and more.

## Galaxy S series

Value priced Galaxy 170 S is ideal for applications that require standard incubation. Providing 170 L capacity, it delivers the same high performance as advanced R models, but uses an LED display.

## Advanced Galaxy R series

With extra options such as O<sub>2</sub> control, this series is suited for traditional and non-traditional applications, including cGMP work, cancer research, stem cell research and more. 48 L and 170 L capacity models are available. The advanced LCD push-button controller provides:

- > Quick viewing of multiple parameters
- > Comprehensive and rapid analysis of real time and historical conditions, including trend graphs
- > Quick changes in environmental and alarm settings, on-screen troubleshooting and diagnostics
- > 72-hour continuous data logging records environmental conditions, temperature, alarms and more
- > Password protected settings and alarm setpoints

## A wide range of options

- > 120 °C High Temperature Disinfection (HTD) effectively eliminates contamination (see page 9 for results)
- > O<sub>2</sub> control (R series) creates hypoxic environment perfect for stem cell research and oncology studies; 0.1-19 % and 1-19 % control options available
- > Humidity alert and monitoring package (R series); includes probes to monitor relative humidity levels in the chamber and an alarm function for low water levels in the humidity pan
- > 170 R model available with seamless oxidizing copper chamber for the utmost in contamination protection



Optional 2-, 4- and 8-split inner door for easy access to samples while maintaining temperature uniformity and reducing gas consumption. See ordering information for availability by model



# New Brunswick™ S41i

The New Brunswick S41i is designed specifically for suspension cell culture applications. It combines precise temperature and CO<sub>2</sub> control, high-temperature disinfection, and a premium New Brunswick shaker for a stable and secure environment that achieves high cell yield and viability.

The New Brunswick S41i minimizes CO<sub>2</sub> consumption without compromising cell growth and viability. Performance tests have shown that it reduces costly gas consumption when compared to competitor models.

- > Includes all standard Eppendorf CO<sub>2</sub> Incubator features (pages 4 and 5)
- > Intuitive touch screen controller
- > Heavy-duty, triple eccentric drive shaker for stable, uniform, and vibration-free motion
- > High temperature disinfection (HTD) standard
- > Sealed inner glass door for sample viewing
- > Low CO<sub>2</sub> gas consumption



Intuitive controller provides the same advanced features as Galaxy R series (see facing page) in a touchscreen design



Removable shelf enables shaking of suspension cell cultures while incubating adherent cells under the same conditions

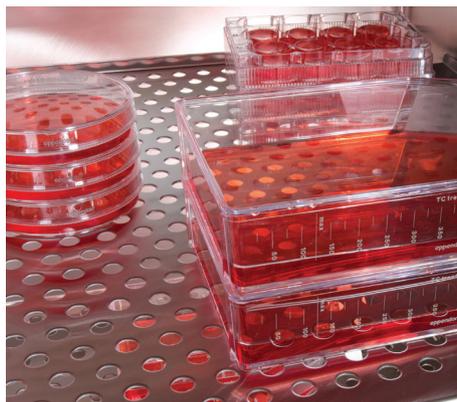


Built-in New Brunswick shaker provides stable, uniform, vibration free motion

## Maximize Your Growth



BioCommand SFI software provides historical data logging and generates multi-unit reports to your local computer



Additional perforated or non-perforated shelves and racks



Stacking stands available for space-saving convenience



Galaxy Electronic Gas Analyzers monitor key environmental levels: CO<sub>2</sub>, O<sub>2</sub>, RH, or temperature

### Galaxy Electronic Gas Analyzers

- > CO<sub>2</sub> Analyzer
- > CO<sub>2</sub> and O<sub>2</sub> Analyzer
- > CO<sub>2</sub>, O<sub>2</sub> and RH Analyzer

### Features

- > On-board data storage – up to 1000 readings
- > Large, well-lit and easy-to-read display
- > Highly accurate, reliable performance
- > Integral hydrophobic sample filter
- > Simple calibration procedure

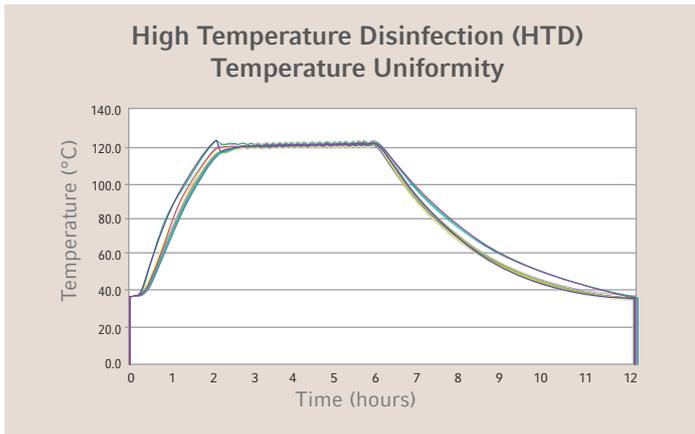
### Technical Specifications

Net Weight	495 g	
Dimensions (L x W x D)	165 x 100 x 55 mm	
Range	CO <sub>2</sub>	0 – 20 %
	O <sub>2</sub>	0 – 100 %
	RH	0 – 100 %
	Temperature	0 – 50 °C
Measurement Accuracy	CO <sub>2</sub>	± (1 % measuring range +2 % of reading) at reference points
	O <sub>2</sub>	± 1.0 % measuring range at constant temperature and pressure
	RH	± 1.5 % RH across the range
	Temperature	± 0.2 °C from 32 to 44 °C, ± 0.5 °C over the rest of the range
Visual and Audible Alarm	User-selectable CO <sub>2</sub> and O <sub>2</sub> alarm levels	
Communications	USB type B mini-connector, HID device class	

### Options

- > Optional temperature probes can be added to any model to provide up to two independent temperature measurements 0 – 50 °C
- > PC-based external storage and data management software

# Protect Your Process



Twenty temperature sensors were placed throughout the interior of a Galaxy 170 R during an HTD cycle, five probes on each of the four shelves. This graph illustrates the temperatures recorded on all 20 sensors. Performance tests conducted by external lab for Eppendorf in April 2014.

Test Organism	% Reduction
<i>Bacillus subtilis</i> (spores)	99.852 %
<i>Geobacillus stearothermophilus</i> (spores)	99.815 %
<i>Candida albicans</i>	>99.999 %
<i>Aspergillus brasiliensis</i> (spores)	>99.999 %
<i>Mycoplasma gallisepticum</i>	>99.994 %

Each strain of microorganism was inoculated and incubated on coupons made from four different surface materials that are commonly present in the Galaxy CO<sub>2</sub> Incubator: Stainless steel chamber, Outer door gasket, white porous cover of CO<sub>2</sub> sensor and inner glass door. The % reduction shown above is the average of 4 coupons for each microorganism after one 120 °C HTD cycle in a Galaxy 170 R CO<sub>2</sub> Incubator.

## Trusted Service from Eppendorf

**epServices**  
for premium performance

Eppendorf offers a wide range of services for consistently reliable incubator performance and culturing results.

### A choice of performance plans

Three service maintenance plans are offered to ensure that the CO<sub>2</sub> incubator is maintained in proper working condition and cell culture environment is consistently stable. Eppendorf service plans feature:

- > Eppendorf customer care and quality commitment
- > Readily available genuine quality-inspected Eppendorf parts
- > Certified service reports and advisory service labels

### Quality Management

Eppendorf offers certification services to satisfy quality management requirements, including Installation Qualification (IQ) and Operational Qualification (OQ) certification that guarantee instrument installation and performance according to manufacturer's specifications. Documentation is provided for regulatory compliance.

### Value of epServices

- > Reliable system performance and culturing results over the entire instrument lifetime
- > GLP compliant documentation
- > Optimized service ▶ Optimized yield ▶ Guaranteed results

**Technical Specifications**

Model	Galaxy® 48 R	Galaxy® 170 S	Galaxy® 170 R	New Brunswick™ S41i
Capacity (L)	48	170	170	170
Dimensions, W x D x H				
Internal (cm)	40.1 x 30.5 x 40.1	53.3 x 44.4 x 69.1	53.3 x 44.4 x 69.1	69.3 x 45.1 x 54
External (cm)	48.3 x 47.5 x 64.5	68.6 x 67.8 x 84.3	68.6 x 67.8 x 84.3	84.8 x 83.4 x 73
Net weight (kg)	31.8	89.9	89.9	152
Benchtop (B), Under bench (U), Floor stand (F) or Stackable (S)	B, U, F, S (x2)	B, U, F, S (x2)	B, U, F, S (x2)	U, F, S (x2)
Display	LCD	LED	LCD	Touch screen
Number of shelving racks	3 (6 optional)	4 (8 optional)	8	2
Number of shelves	3 (6 optional)	4 (8 optional)	4 (8 optional)	1 (2nd optional)
Sealed inner glass doors		Yes	Yes	Yes
Perforated shelves	Yes	Yes	Yes	Yes
On-board data logging	Yes		Yes	Yes
Temperature range		Ambient + 4 – 50 °C		Ambient + 4 – 50 °C
Temperature uniformity		± 0.3 °C		± 0.25 %
Temperature control		± 0.1 °C		± 0.1 °C
Temp. stability at 37 °C		± 0.1 °C		± 0.1 °C
CO <sub>2</sub> range		0.2 – 20 %		0.2 – 20 %
CO <sub>2</sub> uniformity		± 0.1 %		± 0.1 %
CO <sub>2</sub> control		± 0.1 %		± 0.1 %
CO <sub>2</sub> stability at 5 % CO <sub>2</sub>		± 0.2 %		± 0.2 %

**CO<sub>2</sub> Incubator Accessories Ordering Information**

Description	Order no.
<b>Gas management and analysis accessories</b>	
CO <sub>2</sub> supply line filters (2)	P0628-5020
Autozero port filter	P0628-5060
In-line pressure regulator, for all gases	P0628-5030
CO <sub>2</sub> cylinder auto-changeover controller	P0628-5000
Galaxy® CO <sub>2</sub> gas analyzer	P0628-6150
Galaxy® CO <sub>2</sub> and O <sub>2</sub> gas analyzer	P0628-6831
Galaxy® CO <sub>2</sub> , O <sub>2</sub> and RH gas analyzer	P0628-7890
Temperature probe, 5 mm tip for gas analyzer	P0628-7881
Temperature probe, 100 mm tip for gas analyzer	P0628-7880
Two stage CO <sub>2</sub> regulator	P0628-5010
Two stage N <sub>2</sub> regulator	P0628-7220
Two stage O <sub>2</sub> regulator	P0628-7222
<b>Galaxy® 48 R / Galaxy® 48 S, shelves, pans and stacking stand</b>	
Multi-position shelf rack	P0628-5100
Additional shelf, perforated	P0628-5080
Lower stacking frame, with casters	P0628-5090
Upper stacking frame	P0628-6720
Lower and upper stacking frame, with casters	P0628-5091
Under bench stand with feet, 200 mm	P0628-6730
Under bench stand with castors, 200 mm	P0628-6731
2 split inner doors, retrofit	P0628-6741

**CO<sub>2</sub> Incubator Accessories Ordering Information**

Description	Order no.
<b>Galaxy® 170 R / Galaxy® 170 S, shelves, pans and stacking stand</b>	
Multi-position shelf rack (standard on Galaxy® 170 R, optional on Galaxy® 170 S)	P0628-6390
Additional shelf, perforated (2)	6710 859.009
Lower stacking frame, with casters	6710 070.219
Upper stacking frame	6710 070.200
Safety latch kit	6710 070.235
4 split inner doors, retrofit	6710 866.005
8 split inner doors, retrofit	6710 868.008
<b>New Brunswick™ S41i, platforms, shelves and stacking stand</b>	
Universal platform	M1334-9920
125 mL Dedicated platform	M1334-9921
250 mL Dedicated platform	M1334-9922
500 mL Dedicated platform	M1334-9923
1 L Dedicated platform	M1334-9924
2 L Dedicated platform	M1334-9925
2.8 L Dedicated platform	M1334-9926
4 L Dedicated platform	M1334-9927
Additional shelf, perforated	M1334-9351
Stacking kit	M1334-0800
<b>Electronics and software</b>	
BioCommand® SFI software, monitors and records key operating parameters from multiple shakers, CO <sub>2</sub> incubators and other laboratory equipment	M1291-1001
Cable, for connecting additional incubators	P0620-7012
RS-232 to USB converter, 4-port	P0460-7751
RS-232 to USB converter, 8-port	P0460-7750

CO<sub>2</sub> Incubator Ordering Information

Device	HTD	O <sub>2</sub> Control	Split Inner Door	Humidity package	Copper Chamber	230 V, 50/60 Hz <sup>†</sup>	120 V, 50/60 Hz
						European	USA
Galaxy® 48 R	–	–	–	–	–	CO48300001*	CO48200005*
	–	1 - 19 %	–	–	–	CO48320001*	CO48220005*
	Yes	–	–	–	–	CO48310001*	CO48210005*
	Yes	–	2	–	–	CO48312001	CO48212005
	Yes	0.1 - 19 %	–	–	–	CO48310041	CO48210045
	Yes	0.1 - 19 %	–	Yes	–	CO48310061	CO48210065
	Yes	0.1 - 19 %	2	–	–	CO48312041	CO48212045
	Yes	0.1 - 19 %	2	Yes	–	CO48312061	CO48212065
	Yes	1 - 19 %	–	–	–	CO48330001*	CO48230005*
	Yes	1 - 19 %	2	–	–	CO48332001	CO48232005
	Yes	1 - 19 %	2	Yes	–	CO48332011	CO48232015
	Galaxy® 170 S	–	–	–	–	–	CO17101001*
–		–	4	–	–	CO17104001	CO17004005
Yes		–	–	–	–	CO17111001*	CO17011005*
Yes		–	4	–	–	CO17114001*	CO17014005*
Galaxy® 170 R	–	–	–	–	–	CO17301001*	CO17201005*
	–	–	4	–	–	CO17304001	CO17204005
	–	–	8	–	–	CO17308001	CO17208005
	–	1 - 19 %	–	–	–	CO17321001*	CO17221005*
	–	1 - 19 %	4	–	–	CO17324001	CO17224005
	–	1 - 19 %	8	–	–	CO17328001	CO17228005
	Yes	–	–	–	–	CO17311001*	CO17211005*
	Yes	–	–	Yes	–	CO17311011	CO17211015
	Yes	–	–	–	Yes	CO17311021	CO17211025
	Yes	–	–	Yes	Yes	CO17311031	CO17211035
	Yes	0.1 - 19 %	–	–	–	CO17311041	CO17211045
	Yes	–	4	–	–	CO17314001	CO17214005
	Yes	–	4	Yes	–	CO17314011	CO17214015
	Yes	–	4	–	Yes	CO17314021	CO17214025
	Yes	–	4	Yes	Yes	CO17314031	CO17214035
	Yes	0.1 - 19 %	4	–	–	CO17314041	CO17214045
	Yes	0.1 - 19 %	4	–	Yes	CO17314051	CO17214055
	Yes	0.1 - 19 %	4	Yes	–	CO17314061	CO17214065
	Yes	–	8	–	–	CO17318001	CO17218005
	Yes	–	8	Yes	–	CO17318011	CO17218015
	Yes	–	8	Yes	Yes	CO17318031	CO17218035
	Yes	0.1 - 19 %	8	–	–	CO17318041	CO17218045
	Yes	1 - 19 %	–	–	–	CO17331001*	CO17231005*
	Yes	1 - 19 %	–	Yes	–	CO17331011	CO17231015
	Yes	1 - 19 %	–	–	Yes	CO17331021	CO17231025
	Yes	1 - 19 %	–	Yes	Yes	CO17331031	CO17231035
	Yes	1 - 19 %	4	–	–	CO17334001*	CO17234005*
	Yes	1 - 19 %	4	Yes	–	CO17334011	CO17234015
	Yes	1 - 19 %	4	–	Yes	CO17334021	CO17234025
	Yes	1 - 19 %	4	Yes	Yes	CO17334031	CO17234035
	Yes	1 - 19 %	8	–	–	CO17338001	CO17238005
	Yes	1 - 19 %	8	Yes	–	CO17338011	CO17238015
	Yes	1 - 19 %	8	Yes	Yes	CO17338031	CO17238035
<b>New Brunswick™ S41i</b>	Yes	–	–	–	–	S411-230-0100*	S411-120-0100*

<sup>†</sup>Last digit is country dependent. For UK/HKG, change 1 to 2; for Australia, change 1 to 3; for China, change 1 to 4.

\*Stock models. All other models are built-to-order. Contact an Eppendorf representative for more information.