



Thermo Scientific Forma Steri-Cycle
CO₂ Incubators

Designed to achieve
your next breakthrough

Thermo
SCIENTIFIC



Thermo Scientific Forma Steri-Cycle CO₂ Incubators

Designed to achieve your next breakthrough

The **Thermo Scientific™ Forma™ Steri-Cycle series** represents a new era in advanced incubator design for sensitive cultures like stem and primary cells in leading research, pharmaceutical and clinical laboratory applications.

Through a holistic approach to culturing, our newest incubator series provides everything necessary for your most demanding and highly critical applications. By combining our latest technology advancements in contamination control and uniform growth conditions with existing proven and reliable features, you are now able to achieve your goals faster, more reliably, and with less effort.

> Better solutions for optimal cell growth

Revolutionary Thermo Scientific™THRIVE™ active airflow technology delivers homogeneous growth conditions fast, avoiding unwanted sample variation.

> Complete contamination control

Proven protection from every direction including ISO class 5 HEPA filtered air, on-demand high-temperature sterilization, and easy to maintain copper.

> Enhanced simplicity

Designed to focus on convenience, allowing you to spend more time on your research and less time managing your incubator.

The Forma Steri-Cycle CO₂ incubator delivers the performance reliability, ease of operation, and value required to support a range of culturing needs from basic research to demanding, leading-edge applications, so you're ready for whatever comes next!



A direct heat CO₂ incubator that better supports you and your science

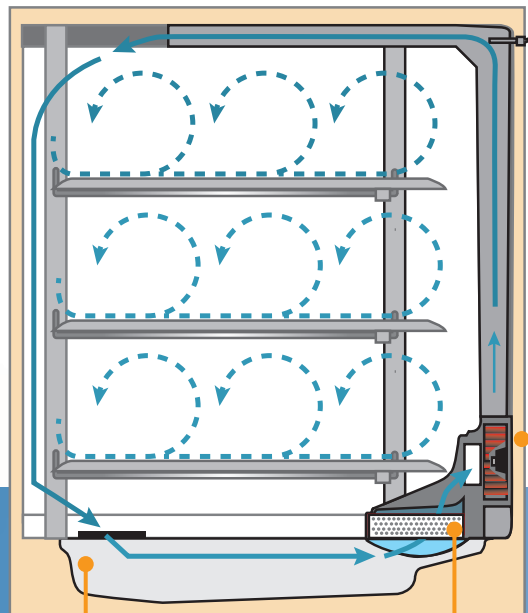
- Choice of either a 165L (5.8 cu ft) or 255L (9.0 cu ft) for a variety of applications
- Readily stackable in a compact footprint
- Choice of electropolished stainless steel or 100% pure copper
- Adjustable, perforated shelving
- Easy-to-clean, coved-corner interior with convenient access port
- Reversible exterior door for added flexibility
- 2 year parts and labor warranty

Better solutions for optimal cell growth

The Forma Steri-Cycle CO₂ incubator incorporates THRIVE active airflow technology, providing faster recovery and uniformity for consistent results. Your cells experience total recovery of all critical growth parameters in **less than 10 minutes following a 30 second door opening.***

Innovative THRIVE active airflow technology

In-chamber fan gently and evenly distributes clean, humidified air throughout the chamber ensuring all cells experience the same conditions without the threat of desiccation.



Incoming air first travels over a direct heated water reservoir resulting in 50% faster humidity recovery than with a standard water pan design.**

The in-line HEPA filter cleans the airstream of microbes and particles protecting cultures from contamination.

The precise, variable speed fan with an auto-stop function disables fan operation during door openings to minimize air exchange. Once the door is closed, the fan temporarily accelerates for quick recovery.

*Based on internal testing standards for a 30 second door opening, recovery time calculated to 98% of starting value for temperature and CO₂ and 95% of starting value for humidity

**Comparison of internal testing data to published specifications



Advanced *in situ* sensor technology

Probes and gas sensors are positioned in the chamber to respond quickly to any deviations in desired conditions

- Robust design allows maintenance-free, *in situ* location, eliminating the need for removal during sterilization and separate cleaning and handling activities
- **New!** Dual temperature probes with PID controller provide over temperature protection by preventing overshoot during recovery; temperatures recover under 5 minutes*
- Oxygen controlled models are equipped with advanced zirconium oxide sensors, enabling a choice of control ranges 1-21% (hypoxic) and 5-90% (hyperoxic)
- On-demand auto-start facilitates easy start-up and calibration

* Temperature recovery time calculated to 98% of starting value, based on internal testing standards of a 30 second door opening on a Forma Steri-Cycle i160 incubator

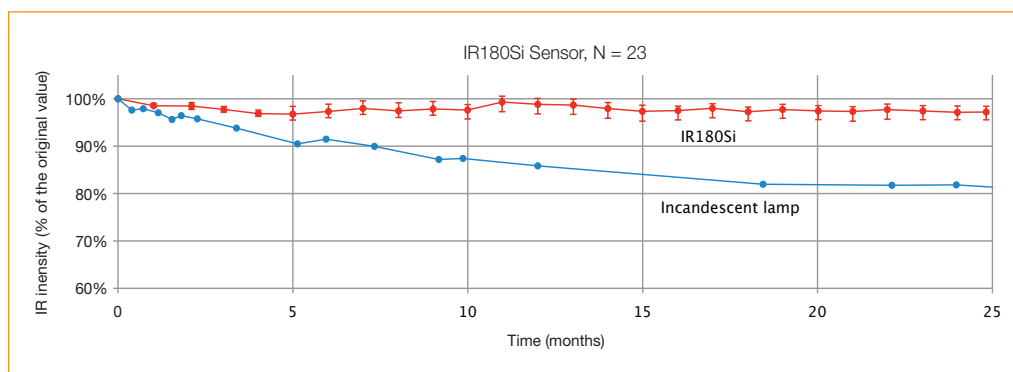


Choice of accurate and reliable CO₂ sensor technology

Temperature resistant, bulb-free IR CO₂ sensor with MEMS emitter technology

New temperature resistant IR180Si infrared CO₂ sensor replaces the traditional incandescent IR light source with silicon MEMS emitter technology that improves stability and reliable service life. This sensor is ideal for labs looking for the best of both technologies for advanced, high volume, or value culturing.

- Internal auto-calibration eliminates drift due to changes in ambient conditions that can affect traditional IR sensors
- IR180Si CO₂ measurement not affected by changes in temperature, humidity, oxygen, or barometric pressure**
- Highly responsive with recovery under 5 minutes from door openings



A traditional IR sensor contains an incandescent bulb that puts out less light as it ages, resulting in sensor drift. The IR180Si eliminates this problem. Our silicon MEMS emitter is designed to retain intensity over time, lasting up to 50% longer than ordinary IR sensors.

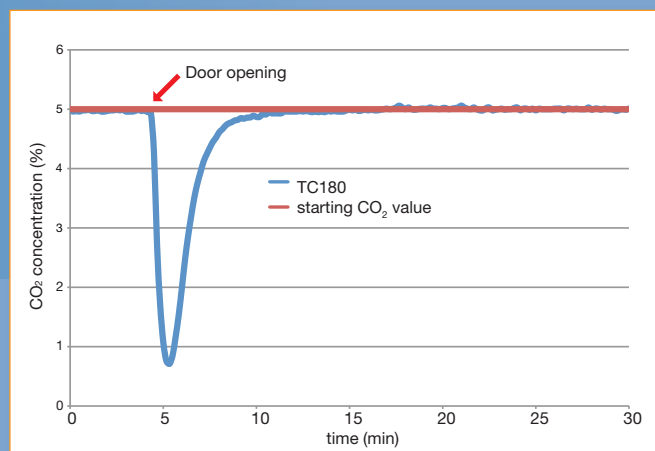
Innovative TC sensor solution

The NEW TC180 offers the performance advantages of traditional IR technologies without the limiting lifespan of a standard incandescent bulb. This sensor is ideal for everyday cell culture applications.

- Improved stability with internal humidity compensation minimizing drift between calibrations
- CO₂ values unaffected by changes in humidity, enabling fast recovery from a routine door opening
- Economical, long service life

*CO₂ recovery time calculated to 98% of starting value, based on internal testing standards of a 30 second door opening

**Information cited based on sensor manufacturer's data



TC180 (Forma i160 incubator)

CO₂ recovery under 6 minutes from a door opening of 30 seconds.

| optimal cell growth



Large capacity Forma Steri-Cycle i250 CO₂ incubator is ideal for high volume cell culture vessels like the Thermo Scientific™ Nunc™ EasyFill™ Cell Factory™

Introducing the New Large Capacity Forma Steri-Cycle i250 CO₂ Incubator.

Now you can choose between the 165L or the 255L capacity. Pick the CO₂ incubator that's right for your lab's needs.

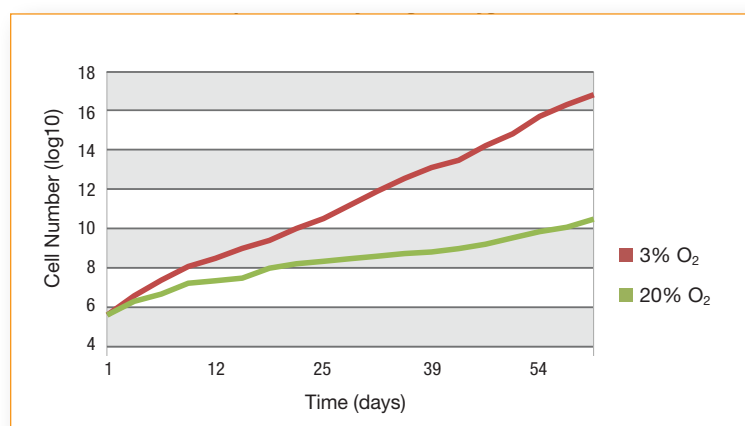
- Ideal for scale-up research and development
- 255L chamber accommodates high throughput and large culture vessels
- Strengthened stainless steel models for increased weight capacity
- Optional reinforced shelves for large capacity, low media level culturing



Added culturing flexibility with variable oxygen control

Many cell types thrive best in CO₂ incubators with reduced oxygen. Culturing cells at lower oxygen concentration will better simulate physiological conditions, resulting in cell behaviors that are more predictive of the *in vivo* environment.

Our variable oxygen control (or “tri-gas”) incubators will generate conditions to help your cells grow faster and healthier. With the Forma Steri-Cycle CO₂ incubator, you can select the incubator for your O₂ range: simulate hypoxic (1-21%) environments for primary cell, stem cell and embryo research applications, or hyperoxic (5-90%) conditions for research in lung, retina and other sensitive tissues.



Primary Cell Growth in Atmospheric and Physiological Oxygen

Cells cultured in low oxygen (hypoxia) will generally grow faster, live longer, and show lower stress.

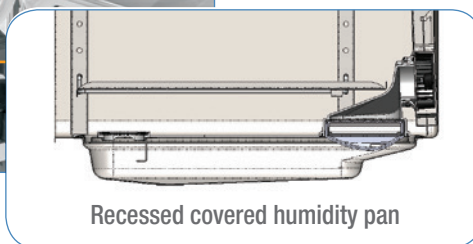
Adapted from Parrinello et al. Nature Cell Biology 2003.

With segmented inner doors, accessing separate sections of the incubator is convenient, minimizing recovery time and contamination risk.

"Our lab mandates this [5% oxygen in the tri-gas incubator] in order to mimic conditions in the body, so that cells are as close to those conditions as possible and nothing is different. All of the signals for proper epigenetics are there."

Stem cell researcher at biomedical research institute





Exclusive condensation free humidification system

Our unique integral covered humidity reservoir maximizes relative humidity without condensation ensuring a dry inner chamber, preventing a breeding ground for contaminants.

- Providing stable, high relative humidity levels, the integrated 3 liter reservoir allows more space for samples than standard pan designs
- The reservoir cover eliminates standing water in the culture area while limiting particles and spilled media from settling into the reservoir
- Water level is continuously monitored and displayed on the Thermo Scientific™ iCAN™ touchscreen with advanced notice of refill needed
- Humidity reservoir may be filled without removing shelves or cultures and is easily drained through built-in copper drain
- CO₂ and optional N₂/O₂ gases are pre-humidified before entering the chamber, providing a more constant, uniform environment

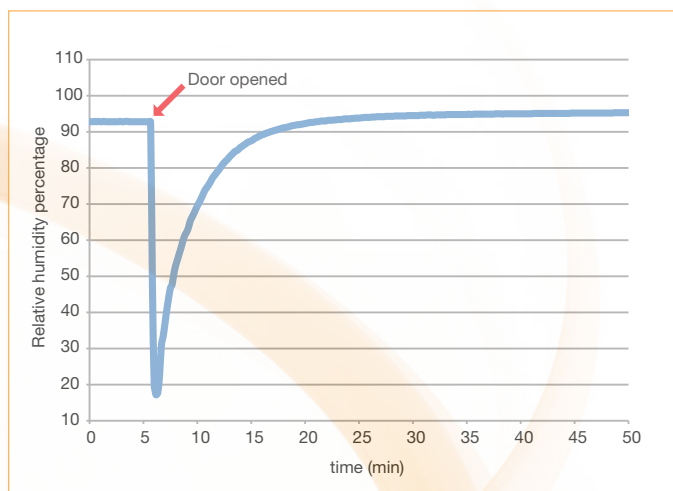
Evaporation is 4X faster at 80% than at ≥ 93% humidity*. Maximum humidity with rapid recovery is critical to limit water evaporation from media that results in toxic concentrations.

*Esser, P and Weitzmann, L. Evaporation From Cell Culture Plates. Thermo Scientific 2011, TILSPNUNCBU02 0111

Directly heated reservoir boosts 5X faster recovery than removable pan designs.

Relative humidity recovery is less than 10 minutes with extended 30 second door opening.**

**Humidity recovery is measured to 95% of starting value.



Complete **contamination control**

Protect your cultures with proven technologies

Our advanced contamination control technologies are designed to protect your valuable cultures, eliminate the loss of time and resources while providing convenient added security for your research work.

“Normal” indoor air contains

30-700 microorganisms/m³.*

Normal flora on our skin equals

10,000 microorganism/cm².**

These can enter your incubator during routine door openings.

* Stryjawska-Sekulska et al. 2007.

** Grice et al. 2008

Forma Steri-Cycle CO₂ incubators deliver the latest innovations in contamination control technologies that protect the incubator air, surfaces and humidification water.

Cultures are continuously protected 24/7, and convenient on-demand high temperature sterilization offers simplified cleaning protocols.

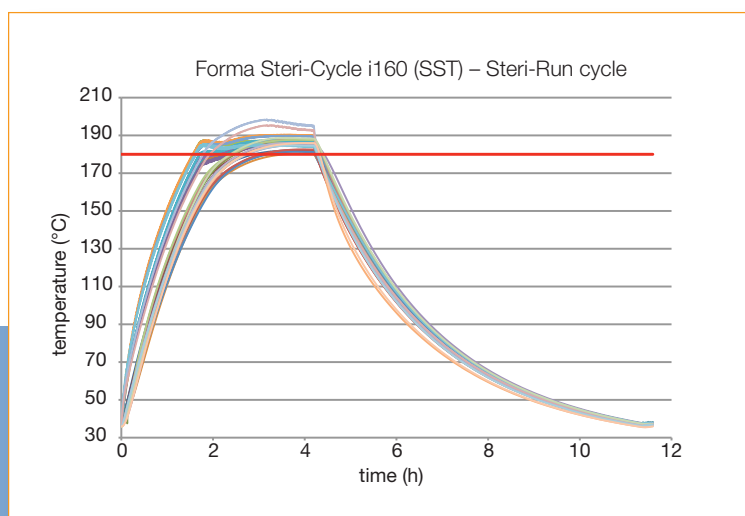
Expand the growth of even your most finicky cells with specialty coated Thermo Scientific™ EasYFlasks™, featuring a unique angled neck for full access to the growth surface when pipetting.

thermoscientific.com/easyflasks

High-temperature sterilization with push button simplicity

Our exclusive Thermo Scientific™ Steri-Run™ high temperature sterilization cycle reaches 180°C on all chamber surfaces and is independently proven to achieve total sterilization and a 12 log Sterility Assurance Level (SAL). With the push of a button, the simple overnight routine provides fast, easy elimination of microbial contaminants and eliminates the need for separate autoclaving of parts.

- Fully automatic 180°C cycle assures total, uniform sterilization of all chamber surfaces (12 log SAL)
- Independent third party tests prove elimination of biological contaminants including fungal mold, vegetative and spore forms of bacteria, including mycoplasma
- Avoids the physical constraints and variation associated with UV germicidal lamps and the ongoing costs, handling and storage of potentially toxic germicides



Validation that all surfaces reach 180°C with 47 point test on all chamber areas including the glass door and shelves.

The U.S. and E.U. Pharmacopeias no longer recommend a given temperature and time for sterilization. Instead, they require proof of performance. To meet requirements of a 12 log SAL, a 6 log reduction of biological indicator endospores must be demonstrated in half the time.

Microorganisms Eliminated During the Steri-Run Cycle*

Microorganism	ATCC #	Average Positive Control*	Number Recovered*	Log Reduction*
<i>Aspergillus brasiliensis</i>	16404	2.98x10 ⁴	NG**	-4.5
<i>Escherichia coli</i>	25922	2.22x10 ⁴	NG	-4.3
<i>Mycoplasma pneumoniae</i>	15531	1.25x10 ⁶	NG	-6.1
<i>Bacillus atrophaeus</i> spores	51189	2.16x10 ⁷	NG	-7.3
<i>Geobacillus stearothermophilus</i> spores	12980	4.81x10 ⁶	NG	-6.7

*Average based on 3 independent tests performed on different days.

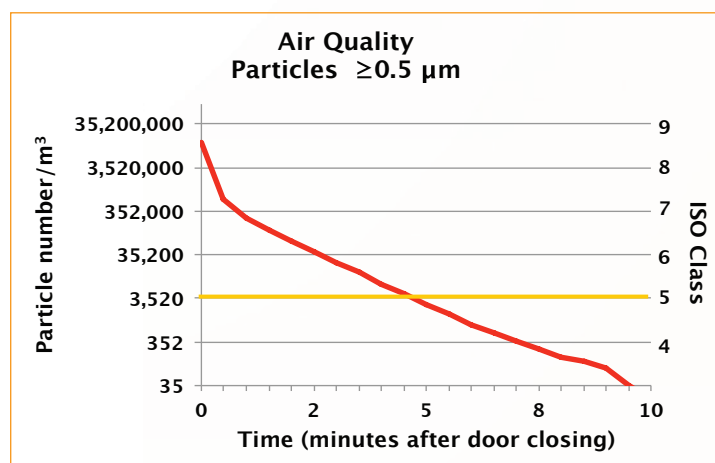
** NG = No Growth

Independent third party testing proved the Steri-Run cycle, when heated to 180°C for 45 minutes, eliminated all microorganisms validating that the full 90-minute cycle meets requirements for a >12 log sterility assurance level (SAL).

HEPA Air Filtration for Air Purity

Airborne particulates are a primary source of contamination in most lab settings. Our advanced HEPA filter technology protects your cultures, providing Class ISO-5 clean room-like air quality conditions within only five minutes after a 30-second door opening.

- Chamber air is filtered every 60 seconds to ensure air quality
- Featuring a space saving configuration, the HEPA filter is readily replaceable with minimal cost



Our unique HEPA air filtration design reaches ISO Class 5 cleanroom air quality and recovers to that quality of air after a door closing within 5 minutes as tested in accordance with ISO 14644-1 and ISO 14644-3.

HEPA filters are rated for their efficiency of capturing $0.3 \mu\text{m}$ sized particles, since this is the most penetrating size.

In fact, larger and smaller particles are caught even more efficiently, over 99.95%

easy to maintain

Easy to maintain 100% solid copper

More cell culture professionals are choosing Thermo Scientific incubators with 100% pure copper interiors.

- Easy-to-clean, no special handling required
- Corrosion resistant copper surfaces provide long service life and are safe for cultured cells
- Durability, reliability, and recyclability makes copper a smart, sustainable choice

"Everything we do is cell based. The main thing I've noticed is my ability to maintain my cells. There is just no comparison since we got the copper. I've had stainless steel incubators before but the comfort level you can have with the copper is simply amazing."

Laboratory Manager with 14 years experience working with all types of mammalian cell lines, including adherent, suspension, hybridomas and transformed stem cells

Enhanced Simplicity

The Forma Steri-Cycle series was designed to simplify your interaction with the incubator. Spend more time pursuing your science and less time managing your equipment.

Main screen with a bright LED display provides at-a-glance monitoring even from a distance.

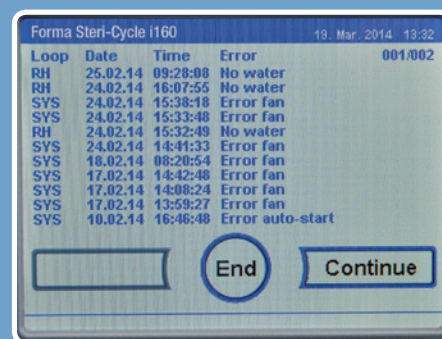
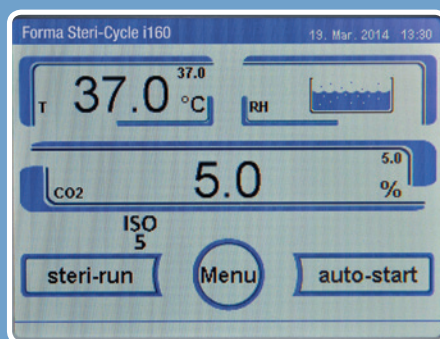
iCAN Touchscreen Interface

Total control at your fingertips

The intelligent iCAN interface provides complete data visibility to monitor all incubator interaction, featuring door-mounted position for easy access, on-screen menu prompts, error and usage logs, data logging, performance trend graphing and multiple language selection.

New rH monitoring assures the proper humidity level with blue, full line icon. Low water alarm indicates critical low humidity levels requiring water addition.

ISO 5 icon indicates the chamber has reached clean room air quality, protecting your cultures.



▲ **On-demand data and error logs** provide a downloadable history of activity and conditions including parameter changes and alarms.



Optimized chamber design for easy maintenance and monitoring

- Conveniently manage reminders for HEPA filter, Steri-Run sterilization cycle and Autostart automatic calibration functions
- Programmable access code ensures additional security of your settings and information
- Selectable languages simplify operation: English, Spanish, German, French, Italian, Japanese and Mandarin
- For easier water handling, humidity reservoir may be filled or drained without the removal of shelves or cultures
- Easy-to-clean, coved corners with convenient access port
- No special tools required for assembly and disassembly of interior components



Data collection

Retire your laboratory notebook, data collection is easy with a Forma Steri-Cycle incubator. A data collection software disc is supplied with each unit, to facilitate data capture from the unit's convenient rear mounted USB output port.

Optional 4-20 mA signal output is available for interfacing with external data collection systems, such as Thermo Scientific™ Smart Vue™ remote monitoring system which is ideal for GMP environments with external sensors and CFR-21 compliant software packages.

		Forma Steri-Cycle i160 CO ₂ Incubator	Forma Steri-Cycle i250 CO ₂ Incubator
construction	Chamber volume	165L (5.8 cu.ft.)	255L (9.0 cu ft)
	Interior chamber	electropolished stainless steel or 100% solid copper	
	Exterior chamber	18 gauge (1 mm), cold-rolled steel, powder coated	
	Access port	42 mm diameter	
	Data outputs	remote alarm contacts, USB, and optional 4-20 mA	
dimensions	Internal dimensions (w x h x d)	470 x 607 x 576 mm	607 x 670 x 629 mm
		18.5 x 23.9 x 22.7 inches	23.9 x 26.4 x 24.8 inches
	External dimensions (w x h x d)	637 x 900 x 880 mm	774 x 968 x 934 mm
		25.1 x 35.4 x 34.6 inches	30.5 x 38.1 x 36.8 inches
	Operating weight	83 kg (without accessories), (183 lbs)	97.5 kg (215 lbs)
shelves	Dimensions (w x d)	423 x 465 mm (16.7 x 18.3 in)	560 x 500 mm (22.05 x 19.68 in)
	Number standard/maximum	3/10	3/12
	Max. load per shelf/total load	10/30 kg (22/66 lbs)	10/30 kg (CU models), 14/42 kg*(SST models)
	Construction	perforated, adjustable	
electrical	Rated voltage	1/N/PE AC (± 10%), 230, 220V, 120V, 100V	
	Nominal kW consumption (Steri-Run)	0.56 (1.06) – 230V, 0.51 (0.97) – 220V	0.76 (1.26)- 230V, 0.69 (1.16) -220V,)
		0.55 (1.01) - 120V, 0.39 (0.72) – 100V	0.75 (1.25)-120V, 0.53(0.89)-100V
	Rated frequency	50/60 Hz	
	Heat emission to environment at 37°C	0.06 kWh/h	0.07 kWh/h
	During Steri-Run:	0.26 kWh/h (average), 0.78 kWh/h (heating time), 0.59 kWh/h (hold time)	
temperature	Control	±0.1°C	
	Range	Range 3°C above ambient to 55°C	
	Uniformity	< ±0.3°C	
	Ambient range	18...34°C	
	Tracking alarm	±1°C	
sterilization cycle	Cycle temperature	180°C on all internal surfaces	
	Cycle duration	Under 12 hours	
humidity	RH	>_93% @ 37°C	
	Humidity reservoir	max. 3L / min 0.5L	
CO ₂	Control	± 0.1%	
	Range	1-20%	
	Tracking alarm	±1%	
	Inlet pressure	12-15 PSI (0.8-1.0 bar)	
	Gas purity	min. 99.5 or medical quality	
	CO ₂ inlet	1/8" hose (barbed)	
O ₂	Control	± 0.1%	
	Range	1-21% or 5-90%	
	Tracking alarm	±1%	
	Inlet pressure	12-15 PSI (0.8-1.0 bar)	
	Gas purity	min. 99.5 or med. quality	
	O ₂ inlet	1/8" hose (barbed)	

Select the Forma Steri-Cycle incubator that best meets your culturing needs



Forma Steri-Cycle i160 CO₂ Incubator

Stainless Steel
Interior

100% Copper
Interior

TC Sensor

Single chamber with TC CO₂ sensor, 100V 50/60Hz *

51030299

51030298

Single chamber with TC CO₂ sensor, 120V 50/60Hz

51030301

51030300

Single chamber with TC CO₂ sensor, 230V 50/60Hz

51030303

51030302

Dual chamber with TC CO₂ sensor, stacking adapter, and roller dolly 120V 50/60Hz

50145518

50145520

Dual chamber with TC CO₂ sensor, stacking adapter, and roller dolly 230V 50/60Hz

50145519

50145521

IR Sensor

Single chamber with IR CO₂ sensor, 100V 50/60Hz *

51030634

51030633

Single chamber with IR CO₂ sensor, 120V 50/60Hz

51030532

51030531

Single chamber with IR CO₂ sensor, 230V 50/60Hz

51030534

51030533

Dual chamber with IR CO₂ sensor, stacking adapter, and roller dolly 120V 50/60Hz

50145522

50145524

Dual chamber with IR CO₂ sensor, stacking adapter, and roller dolly 230V 50/60Hz

50145523

50145525

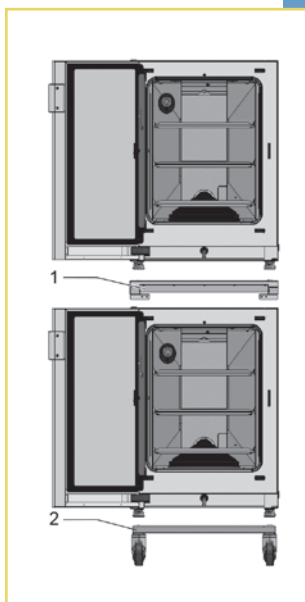
* For 100V units, the left hinged door orientation is standard

Ideal for use inside your CO₂ incubator



Thermo Scientific™ CO₂ Resistant Shaker

Provides reliable around-the-clock operation ideally suited to keep your cells alive and flourishing within your working environment.



Units are easily stackable. Required stacking adapter provides efficient heat dissipation to operate Steri-Run in one unit while culturing in the other without process disruption.

Forma Steri-Cycle i250 CO₂ Incubator

	Stainless Steel Interior	100% Copper Interior
TC Sensor		
Single chamber with TC CO ₂ sensor, 100V 50/60HZ	51030978	51030977
Single chamber with TC CO ₂ sensor, 120V 50/60HZ	51030980	51030979
Single chamber with TC CO ₂ sensor, 230V 50/60HZ	51030982	51030981
IR Sensor		
Single chamber with IR CO ₂ sensor, 100V 50/60HZ	51031006	51031005
Single chamber with IR CO ₂ sensor, 120V 50/60HZ	51030998	51030997
Single chamber with IR CO ₂ sensor, 230V 50/60HZ	51031000	51030999

Options and accessories to customize your Forma Steri-Cycle CO₂ incubators

factory installed*

	Forma Steri-Cycle i160 CO ₂ Incubator	Forma Steri-Cycle CO ₂ Incubator i250
Country Versions		
Electrical configuration for Switzerland	51900300	
Electrical configuration for Great Britain	51900303	
Electrical configuration for Italy	51900306	
Electrical configuration for Australia	51900449	
Electrical configuration for Denmark	51900481	
Electrical configuration for China	51900900	
Chamber Configuration		
Internal 4-20 mA analog data output	51901143	
Left hinge door configuration	51900293	
Internal gas guard for CO ₂	51900735	
Internal gas guard for N ₂ /O ₂	51900736	
Stainless steel external outer casing	51901126	
3 door inner gas tight screen (replaces single inner door configuration)	51901144	
6 gas tight inner doors (replaces single inner door configuration)		51901127
6 each of split shelf, copper (for use with 6 gas tight inner door configuration)		51901122
6 each of split shelf, stainless steel (for use with 6 gas tight inner door configuration)		51901123
Reinforced shelves, copper		51901161
Reinforced shelves, stainless steel		51901162
O₂ Control		
1-21% O ₂ control	51901137	
5-90% O ₂ control	51901138	
1-21% O ₂ control with 3 door inner gas tight screen door	51901145	
5-90% O ₂ control with 3 door inner gas tight screen door	51901146	
1-21% O ₂ control with gas tight screen 6 inner glass doors and 1/2 width shelves		51901133
5-90% O ₂ control with gas tight screen 6 inner glass doors and 1/2 width shelves		51901134

* Factory installed options may only be added to single chamber unit part numbers.



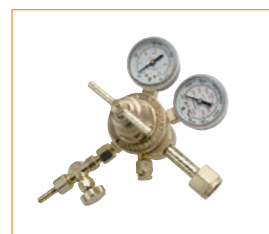
External stainless steel option
for easy cleaning and GMP
environments



HEPA Filter



CO₂ Resistant Shaker



Regulator

Options and accessories to customize your Forma Steri-Cycle CO₂ incubators

customer installed

	Forma Steri-Cycle i160 CO ₂ Incubator	Forma Steri-Cycle i250 CO ₂ Incubator
Support Frames, Stacking Adapters and Shelving		
Support frame for double chamber, 172 mm high (with castors)	50145394	50145623
Support frame for double chamber, 200 mm high (without castors)	50145435	50149102
Support frame for single chamber, 780 mm high (without castors)	50145436	50149125
Castors for stands	50052528	
Adaptor required for stacking i160 models	50148171	
Adaptor required for stacking i250 models		50148174
Stacking adaptor for Steri-cycle i160 on top of Steri-cycle models 370, 371, 380, and 381	50148173	
Steel shelf, full-width, 2 support rails	50051909	50065793
Additional shelf, solid copper, full-width, with 2 support rails	50051910	50065794
Reinforced shelf, copper		50150644
Reinforced shelf, stainless steel		50150643
Set of 4 HERAtrays, 1/4 width, in stainless steel		50065807
Set of 4 HERAtrays, 1/4 width, in copper		50065808
Set of 3 HERAtrays, 1/3 width, in stainless steel	50051913	50065805
Set of 3 HERAtrays, 1/3 width, in solid copper	50051914	50065806
Set of 2 HERAtrays, 1/2 width, in stainless steel	50058672	
Set of 2 HERAtrays, 1/2 width, in copper	50061050	
Set of 2 HERAtrays, 1/2 width for half width shelves, in stainless steel		50065809
Set of 2 HERAtrays, 1/2 width for half width shelves, in copper		50065810
CO₂/O₂ Accessories and Monitoring		
Replacement in chamber HEPA filter		50141920
Replacement prefilter		50144774
Door lock retrofit kit, key entry, to prevent unauthorized access		50145438
CO ₂ gas regulator, 2-stage, for gas tank		3429937
N ₂ gas regulator, 2-stage for gas tank		3429942
O ₂ gas regulator, 2-stage for gas tank		3429943
External gas guard automatic change-over to reserve tank, 120 V, 50/60 Hz		50059043
External gas guard automatic change-over to reserve tank, 230 V, 50/60 Hz		50046033
IR gas tester with travel case (for advanced calibration and testing purposes for CO ₂ model)		50121515
IR Tester for CO ₂ /O ₂		50145789
IR gas tester interface kit		50122015
5 inlet port filters for IR testers		50060287
Shakers for CO₂ incubators		
Thermo Scientific CO ₂ resistant, 120V		88881101
Thermo Scientific CO ₂ resistant, 230V		88881102
Thermo Scientific CO ₂ resistant with universal platform, 120V		88881103
Thermo Scientific CO ₂ resistant with universal platform, 230V		88881104



Stacking Adaptor



Wheel Frame



High Frame



Low Frame



Gas Tight Inner Doors
with Split Shelves



Stainless Steel and Copper
Shelves



WolfLabs

Pricing on any accessories shown can be found by keying the part number into the search box on our website.

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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Please contact us if this literature doesn't answer all your questions.