Thermo Scientific Forma® Direct Heat CO_2 Incubators

Reliable performance and superior value

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Thermo Scientific Forma Direct Heat CO_2 Incubators – High performance and low maintenance

Thermo Scientific Forma Direct Heat CO_2 Incubators combine high capacity and dependable performance in an easy to use design, for researchers who prefer the convenience of direct heat temperature control technology.

- **High capacity chamber for maximum culturing space –** We provide a 6.5 cu. ft. (184.1 liters) interior volume and include heavy-duty stainless steel shelves to support a full product load.
- **Adaptable to your needs –** The ideal solution for basic cell culture incubation, the flexible Direct Heat Incubator can be configured with your choice of either TC (thermal conductivity) or IR (infrared) CO_2 gas sensors, and a variety of useful process and contamination control options, to meet your specific requirements.
- **Easy configuration and use –** Quality construction, proven reliability and convenience, our direct heat CO_2 incubators are designed for simple operation and fast and easy cleaning.

Thermo Scientific Forma Direct Heat Incubators are readily stackable to preserve floor space (hardware included).

Precise direct heat temperature control
Lighter in weight and more mobile than traditional water jacketed designs, our proven direct heat technology provides the excellent temperature uniformity and recovery characteristics you depend on. With high performance heating elements and advanced insulation surrounding the culture chamber, accurate temperature control is assured.

Designed for easy cleaning

- Polished stainless steel interior with coved corners is easy to clean.
- Sturdy stainless steel shelves and supports are designed to support a full product load, and can be readily removed without tools for easy cleaning or adjustment.
- Microbiological filters are provided on gas inlet and sample ports and are readily accessible for simplified routine replacement.
- Inner door gasket is removable and cleanable, and adjusts continually to ensure a tight seal.

Contamination Control Options

100% HEPA filtered air
An optional, patented, in-chamber HEPA Filter Airflow System continuously filters the entire chamber volume of air every 60 seconds to prevent surface contamination and product loss.

The HEPA filtration system removes airborne contaminants which may enter the incubator upon routine door openings, and are the primary source of contamination in most cell culture lab settings.

HEPA[2]® VOC filtration
An optional built-in VOC filtration system is available to compliment the HEPA system, by removing volatile organic vapors which could cause risk to sensitive cultures. Its molecular sieve technology captures potentially toxic chemicals commonly found in products such as lab solvents, cleaning agents and plastics, which may find their way into the incubator.

Solid Copper Components
Known for its ability to effectively prevent bacterial and fungal growth on contact, an available solid copper interior component kit may be incorporated to provide passive surface contamination protection.

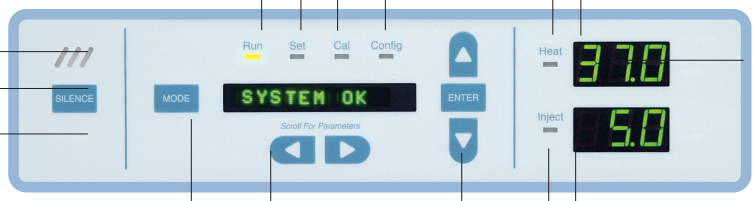
[1] Copper is solid, not plated. Available components include perforated shelves, interior ductwork, and humidity pan. Refer to the Accessories and Specifications sections for details.
[2] U.S. Patents 5,792,427 and 6,117,687

Sturdy stainless steel shelves and supports can be removed without tools for easy cleaning or adjustment

Thermo Scientific Enviro-Scan® Microprocessor Message Center

Easy configuration and use
Slide-out front drawer provides convenient access to electronic components for maintenance.

- Standard remote alarm contacts (NO, NC, COM) and optional RS-485, 0-1V, 0-5V, and 4-20 milliamp data outputs permit connection to an alarm/monitoring system to meet internal and regulatory requirements.
- Flexible, intuitive controls ensuring ease of use.



Calibration – Calibrate temp, CO_2, RH (optional)

System Configuration – Configure audible on/off, access code, HEPA filter change reminder, remote alarm contacts, tracking low temp and high and low CO_2 alarms, and the following options: automatic tank selector, RS-485 interface, and display temp/RH (selectable)

Setpoint – Set temp, overtemp, CO_2

Run – Class 100 timing reminder appears after door is closed for five minutes, message changes to describe alarm conditions

Heater On Indicator

Temperature Display

RH Display

Audible/Visual Alarm

Alarm Silence

Optional Built-In Gas Guard System

CO_2 Display

CO_2 Inject Indicator

Mode Select

Scroll for Program Parameters

Programming Buttons

Thermo Scientific Direct Heat CO_2 Incubators

Description	Cat. No.
RH Display	
Humidity (RH) Display[1], readable in 1% increments, includes low RH programmable alarm (alerts you of the need to add water to humidity pan), factory installed	190643
Chamber and Shelf Components	
Independent Inner Glass Door Kit (eight doors with latches), mounts inside heated inner glass door, is removable and can be autoclaved	190650
Solid Copper Components	
Copper Shelf Kit	190879
Copper Humidity Pan	237020
Copper Ductwork[1]; includes shelf supports, top duct, shelf channels, four shelves, and pan; factory installed	190870
Stainless Steel Components	
Stainless Steel Shelf Kit	190884
Stainless Steel Humidity Pan	237016
Stainless Steel Ductwork; includes side ducts and shelf channels	190670
Filtration[2] and Decontamination Kits	
HEPA Filter Airflow System; factory installed	190858
Replacement HEPA filter	760175
HEPA Value Pack (four filters)	760209
HEPA Filter Replacement Kit; includes HEPA; in-line, and access port filters	1900067
HEPA[2] VOC Filter Replacement Kit; includes HEPA[2] in-line and access port filters	1900094
HEPA[2] VOC Filtration System Kit; converts HEPA Filter Airflow System to HEPA[2] Filtration System; includes HEPA[2] filter and two plugs	760199
Decontamination Kit for HEPA filtered units	190868
Decontamination Kit for standard units	190869
CO_2 Accessories	
CO_2 Fyrite® Analyzer Kit, 0-20%	155021
Built-in CO_2 Gas Guard to monitor CO_2 supply, automatically switches from one cylinder to the other when the supply is exhausted, factory installed	190640
Two-Stage CO_2 Gas Regulator with barbed connection and shut-off valve	965010
Wall Clamp for a CO_2 Bottle; includes cylinder holder with web strap	950316
Roller Dolly	
Roller Dolly (heavy-duty, powder coated steel base) with dual-wheel, swivel locking casters and leveling feet; supports one or two (stacked) incubators; raises unit 3.0" (7.6cm) off the floor	1900063
Monitoring and Alarm Systems	
Monitor/Alarm System, interfaces with as many as 24 products (channels) to monitor and display equipment conditions up to 2,000 ft. away	1535
Sensaphone® Telephone Dialing Systems, interface with standard touch-tone phone system	
For up to four input channels	400047
For up to eight input channels	400134
Data Outputs[1] (select one)	
RS-485 interface	190523
4-20 milliamp	190512
0-5V analog	190543
0-1V analog	190544
Miscellaneous Accessories	
Sealed Modular Incubator Chamber, purge with any gas mixture to create a "mini-incubator" inside your incubator for unusual gas and temperature controlled experiments, dimensions: 12.0" (30.5cm) circular chamber, 4.7" (11.9cm) high	190043
IQ/OQ, MS Windows®– compatible document disk for process customization and detailed checklists to qualify setup and operation	6000310

HEPA Air-Filter (VOC)

Two-Stage CO_2 Gas Regulator

Roller Dolly

Sealed Modular Incubator Chamber

Independent inner glass door kit

Accessories are customer installed unless indicated otherwise.

[1] Factory installed

[2] HEPA and HEPA2 filters are rated a minimum 99.97% efficient at 0.3 microns. Filters are easily replaced without tools.

Thermo Scientific Direct Heat CO_2 Incubators

Specifications

Temperature			
Control	±0.1°C	Uniformity	±0.3°C @ 37°C (98.6F)
Range	5°C above ambient to 50°C (122F)	Tracking Alarm	User-programmable low
Overtemperature			
Sensor	Precision thermistor	Setability	0.1°C
Temperature Safety			
Sensor	Independent thermostat	Controller	Independent analog electronic
CO_2 (choice of T/C or IR sensor)			
Control	Better than ±0.1%	Range	0-20%
Inlet Pressure	15 PSIG (1.0 bar)	Readability and Setability	0.1%
Tracking Alarm	User-programmable high/low		
Humidity (opt. display available)			
RH	Ambient to 95% @ 37°C (98.6F)	Humidity Pan	3.2 qt. (3.0 liters) standard
Perforated, Stainless Steel or Solid Copper shelves			
Dimensions	18.5"x 18.5" (47.0cm x 47.0cm)	Surface Area, Max. per Chamber	2.4 sq. ft. (0.2 sq. m) per shelf, 40.8 sq. ft. (3.8 sq. m) max.
No. standard	4	No. maximum	17
Construction			
Interior Volume	6.5 cu. ft. (184.1 liters)	Interior	Type 304, shiny, stainless steel or solid copper
Exterior	18 gauge, cold-rolled steel		
Outer Door Gasket	Four-sided, molded, magnetic vinyl	Inner Door Gasket	Feather-edged, silicone
Electrical			
Models 310/320/350/360	115V, 50/60 Hz, 2.4 FLA (Operating range 90-125V) NEMA 5-15P Plug		
Models 311/321/351	230V, 50/60 Hz, 2.0 FLA (Operating range 180-250V) CEE 7/7 Plug		
Model 361	230V, 50/60 Hz, 1.5 FLA (Operating range 180-250V) CEE 7/7 Plug		
Circuit Breaker, Power Switch	6 Amps, 2 Pole		
Convenience Receptacle	75 Watts max. (matches cabinet voltage)		
Alarm Contacts	Deviation of temp, CO_2, RH; power failure; customer connections through jack on back of unit		
Access Port, CO_2 Inlet	1.3" (3.3cm) with removable silicone plug, 1/4" barbed hose		
Unit Heat Load	341 BTUH (100 Watts), 85 kcal per hour		
Dimensions			
Exterior	26.1"W x 38.5"H x 24.7"D	Interior	21.3"W x 26.8"H x 20.0"D
	(66.3cm x 97.8cm x 62.7cm)		(54.1cm x 68.1cm x 50.8cm)
Weight			
Net	210 lbs. (95.3 kg)	Shipping (Motor)	270 lbs. (122.5 kg)

Ordering Information

Model	Chamber	CO_2	Voltage
310 (311)	Stainless Steel	T/C	115 (230)
320 (321)	Stainless Steel	IR	115 (230)
350 (351)	Copper	T/C	115 (230)
360 (361)	Copper	IR	115 (230)

All units are UL listed to United States and Canadian requirements and bear the CE Mark.

www.thermoscientific.com/co2incubators

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