



## Thermo Scientific Forma® Series II Water Jacketed CO<sub>2</sub> Incubators

Proven water jacket  
technology



# Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators – # 1 Selling incubators worldwide

**Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators combine precise CO<sub>2</sub> control with a choice of TC or IR sensors, unsurpassed temperature stability, and superior parameter recovery characteristics, with innovative continuous contamination control technology. No wonder they are the first choice of researchers in academic, clinical, biotech and R&D labs around the world!**

- **Security of Proven Water Jacket Technology**  
– maximum thermal stability and quick recovery are assured with our unique triple wall construction, providing superior protection against temperature loss in the event of an unexpected power outage.
- **Total Contamination Control** minimizes the risk of airborne contaminants entering the incubator upon door openings, with a validatable in-chamber HEPA air filtration system, maintaining your cultures in cleanroom-like Class 100 air quality conditions.
- **Adaptable to Your Specific Requirements** configure the roomy 6.5 cu.ft capacity Series II, to your specific needs and work environment, with a choice of CO<sub>2</sub> sensors, reversible door swings and a host of options including available oxygen control, relative humidity monitoring, antimicrobial copper interiors, datalogging and IQ/OQ documentation kits.

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◀ The Series II Water Jacketed Incubators are readily stackable to preserve floor space (hardware included as standard)

U.S. Patents 5,792,427 and 6,117,687; U.S. Patent Des. 387,164  
\*Third party tested/independently verified. Test results and testing protocol are available upon request.

# Complete Contamination Control – Minimized Risk of Product Loss and Downtime

## Designed for Easy Cleaning

- Polished stainless steel interior with 100% covered corners is easy to clean, saving time and reducing contamination risk.
- Sturdy stainless steel shelves and supports can be readily removed without tools for easy cleaning, autoclaving or adjustment
- Patented inner door gasket is removable and cleanable, and adjusts continually to ensure a tight seal.
- Snap fit in-chamber HEPA filter can be easily removed without tools, as needed. The Series II messaging center display informs you when the HEPA should be replaced.

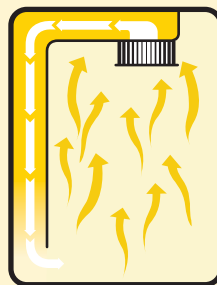
## 100 % HEPA filtration for rapid response class 100 air quality

- The patented in-chamber HEPA air filtration system, continuously filters the entire chamber volume every 60 seconds, reducing particulates to Class 100 cleanroom levels, to preserve your aseptic culturing environment.
- The HEPA filter entraps particulate air contaminants and prevents their escape. Airborne contaminants are the primary source of contamination in most cell culture lab settings. Efficiency and long term effectiveness of the HEPA filter Airflow System protect your cultures and minimize downtime.
- Optimized air flow system design will not interfere with samples or incubator function.
- Class 100 air quality conditions are achieved within 5 minutes following a routine door opening.

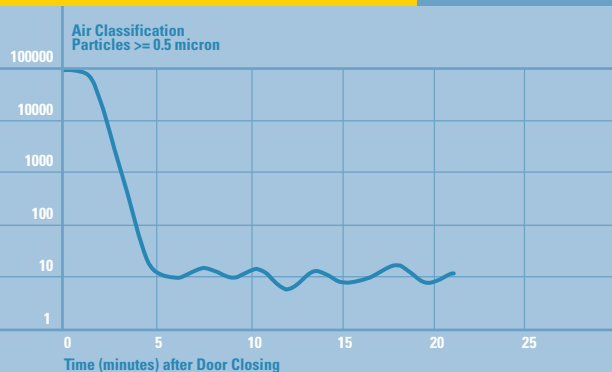
## Volatile Organic Compounds (VOC) filtration system

- An optional built-in VOC filtration system removes volatile organic vapors which could pose 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.
- This easily installed, low maintenance filtration system is more effective and longer lasting than activated charcoal systems in high humidity conditions, such as in a CO<sub>2</sub> incubator.
- Examples of chemicals/vapors filtered include alcohols (ethanol and methanol), alkanes (decane, heptane, hexane), aromatics (toluene, xylene, benzene, styrene), and olefins (cyclohexane).

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



The patented HEPA Filter Airflow System continuously filters the entire chamber volume every minute to provide an aseptic culturing atmosphere



**AIR QUALITY DEFINED**  
Federal Standard 209E and International Standard ISO 14644-1 define air quality classifications (e.g., Class 1, 10, 100 and ISO Class 1, 2, etc.).

The Federal class number is the maximum allowable number of particles 0.5 microns and larger per cubic foot of air. ISO Class 2 correlates most closely to Federal Standard Class 100.

To find out more about the performance of our Class 100 HEPA contamination control system, please visit us at [www.thermo.com/incubators](http://www.thermo.com/incubators)

# Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators

## Proven Water Jacket Technology

Temperature retention and quick recovery are especially important for researchers working with critical cell cultures. Our water jacketed incubator provides maximum thermal protection and quick recovery from swings in ambient temperature and power variations.

- Durable triple wall cabinet construction ensures optimal temperature uniformity. The Series II water jacketed holds temperature longer and recovers to a uniform interior value more quickly than any other technology available today.

- Patented, heated dual pane inner glass door minimizes bothersome condensation with improved responsiveness and faster temperature recovery.

## Do You Trust Your Power Supply?

Power outages can be detrimental to your cultures. If you aren't completely confident in your power supply, consider the security of a Series II Incubator.

- Product testing during a power failure in an 18°C (64.4F) ambient resulted in the water jacketed incubator's temperature gradually dropping only 1°C – from 37°C to 36°C (98.6F to 96.8F) – in 1 hour and approximately 7.6°C in 10 hours.
- The air jacketed incubator's temperature dropped 3°C – from 37°C to 34°C (98.6F to 93.2F) – in 1 hour and 17°C in 10 hours.

## Easy to Configure and Use

Quality construction. Reliable performance. Intuitive controls shared by other products with the Forma name. The Series II Incubator is designed for long life and ease of use.

## Control O<sub>2</sub> Within the Culture Environment

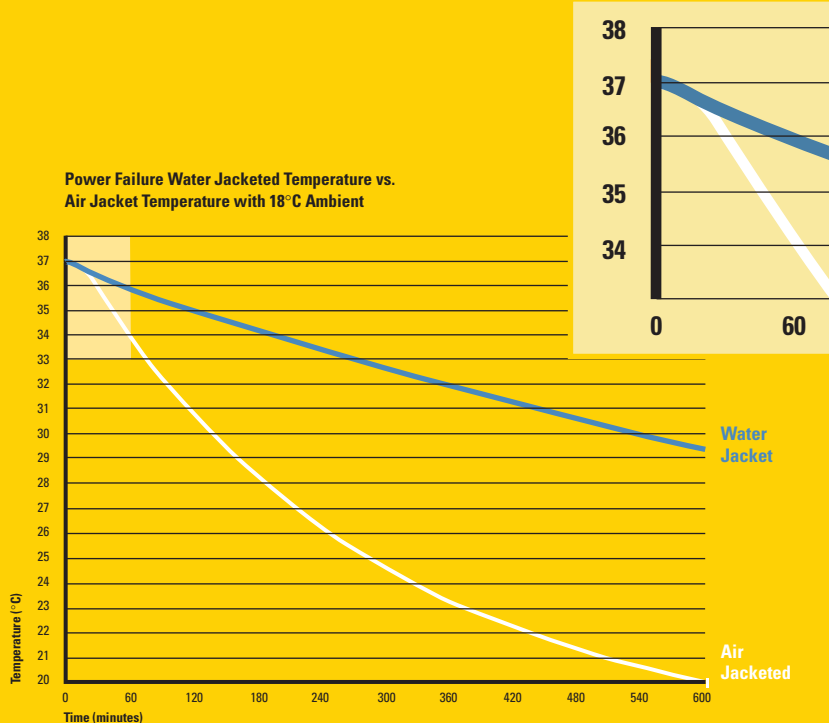
researchers seeking to experiment with the effect of suppressed oxygen concentration upon their cultures can select a Series II model with both CO<sub>2</sub> and O<sub>2</sub> control capabilities. Individual O<sub>2</sub> display facilitates set point and monitoring of desired O<sub>2</sub> levels in a range of 0 – 20% for hypoxic studies.

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## Security of proven water jacket technology.

Should the power go out or the ambient temperature swing, the Series II's triple wall construction holds the temperature better than an air jacket or double wall water jacket design.



# Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators

Recessed Power Switch

Sample Port

Front Fill Port

Smooth Front Fascia

CO<sub>2</sub>/O<sub>2</sub> Sensors (in chamber)

Chamber Thru-Wall Access Port with Filter

Non-CFC Foam Insulated Outer Door (field reversible)

Sturdy Stainless Steel Shelves

Polished Stainless Steel Interior with 100% Coved Corners

Magnetic Outer Door Gasket

Heated Inner Door with Sealed Door Trim

Not shown: Inner Door Switch, Ergonomically Designed Inner Door Knob, and Optional Lock for Inner Door



Thermo Scientific Enviro-Scan® Microprocessor Message Center

Accessory Outlet Alarm Contacts (NO, NC, COM )

Blower Wheel/Scroll (directed airflow)

Dual Temp Probes (in chamber)

HEPA Filter

Triple-Wall Construction Water Jacket

Fiberglass Insulation

Removable, Cleanable Gasket

Stainless Steel Humidity Pan

Water Jacket Drain

Adjustable Feet

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

Audible/Visual Alarm

Alarm Silence

Optional Built-In Gas Guard System

Mode Select

Scroll for Program Parameters

System Configuration – Configure Audible On/Off, Access Code, HEPA Filter Change Reminder, RS-485 Interface, Automatic Tank Selector, Audible/Visual Alarms, Display Temp/RH (selectable), Display CO<sub>2</sub>/O<sub>2</sub> (selectable)

Setpoint – Set Temp, Overtemp, CO<sub>2</sub>, O<sub>2</sub>

Calibration – Calibrate Temp, CO<sub>2</sub>, O<sub>2</sub>, RH

Programming Buttons



Temperature Display

CO<sub>2</sub> Display

Gas Inject Indicator

Heater On Indicator



## Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators

Description	Cat. No.
Accessories are customer installed unless indicated otherwise. In addition to providing a standard line of equipment and accessories, we will manufacture custom accessories to meet your specific requirements. Contact us for details.	
<b>RH Display</b>	
Humidity (RH) Display, readable in 1% increments, includes low RH programmable alarm (alerts you of need to add water to humidity pan), factory installed	190643
<b>Shelving, Ductwork, and Humidity Pan</b>	
Stainless Steel Shelf and Channels	190884
<i>Solid Copper Components –</i>	
Solid Copper Interior Ductwork (in place of stainless steel components); includes copper interior ductwork, four shelves, and humidity pan; factory installed at time of order	190656
Copper Interior Ductwork	1900057
Copper Perforated Shelf with Channels	190879
Copper Humidity Pan (Fig. 01)	237020
<b>Filters* and Decontamination Kit</b>	
Replacement HEPA Filter (Fig. 04)	760175
HEPA Value Pack (4 filters)	760209
10 Disposable Polypropylene In-Line Filters	760210
HEPA Filter Replacement Kit, includes HEPA, inline, and access port filters	1900067
Replacement HEPA <sup>2</sup> VOC Filter	760200
HEPA <sup>2</sup> VOC Filter Replacement Kit, includes HEPA <sup>2</sup> , in-line and access port filters	1900094
HEPA <sup>2</sup> VOC Filtration System (kit), converts HEPA Filter Airflow System to HEPA <sup>2</sup> Filtration System, includes HEPA <sup>2</sup> filter and two silicone plugs	760199
Decontamination Kit, includes sample port, HEPA filters, sensor gasket, wheel, and miscellaneous components	190651
<b>Door Kit, Lock, and Right Hand Door Swing</b>	
Independent Inner Glass Door Kit (eight glass doors with latches), mounts inside heated inner glass door, is removable and can be autoclaved (Fig. 02)	190650
Door Lock for Heated Inner Glass Door	190646
Right Hand Door Swing, factory installed at time of order	190666
<b>CO<sub>2</sub> and N<sub>2</sub> Accessories</b>	
<i>Built-In Gas Guards to monitor CO<sub>2</sub> or N<sub>2</sub>, automatically switch from one cylinder to the other when supply is exhausted, factory installed –</i>	
CO <sub>2</sub> Gas Guard	190640
N <sub>2</sub> Gas Guard	190642
<i>Regulators with barbed connection and shut off valve –</i>	
Two-Stage CO <sub>2</sub> Gas Regulator (Fig. 03)	965010
Two-Stage N <sub>2</sub> Gas Regulator	961027
Wall Clamp for a CO <sub>2</sub> Bottle, includes cylinder holder with web strap	950316
<b>Roller Base and Stand</b>	
Roller Base (heavy-duty steel) with dual-wheel, swivel locking casters and leveling feet; pre-drilled for easy attachment; raises unit 2.8" (7.1cm) off the floor (Fig. 06)	190647
Stand (heavy-duty steel) with leveling feet, raises unit 6.5" (16.5cm) off the floor	190648
<b>Data Outputs (select one), factory installed</b>	
RS-485 interface	190523
4-20 milliamp	190512
0-5V analog	190543
0-1V analog	190544
(continued)	

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Description	Cat. No.
<b>Monitoring and Alarm Systems</b>	
Monitor/Alarm System, interfaces with as many as 24 products (channels) to monitor and display equipment conditions up to 2,000 ft. away	1535
<i>Sensaphone® Telephone Dialing Systems, interface with standard touch-tone phone system –</i>	
For up to four input channels	400047
For up to eight input channels	400134
Datalogger, -50°C to 140°C (-58F to 284F), meets U.S. FDA guidelines: cGLP 21 CFR Part 58, Software Validation 21 CFR Part 820, and Electronic Records 21 CFR Part 11; evaluation software with cable (No. 201910) is available	201904
<i>6", 7 Day Circular Chart Recorders –</i>	
Single pen, 120V	201155
Single pen, 220V	201156
Dual pen, 120V, 2 probes, temp/temp (for stacked incubators)	201157
Dual pen, 220V, 2 probes, temp/temp (for stacked incubators)	201158
Dual pen, 120V, 1 probe, temp/RH	201159
Dual pen, 220V, 1 probe, temp/RH	201160
<b>Miscellaneous Accessories</b>	
Sealed Modular Incubator Chamber, purge with any gas mixture to create a "mini-incubator" inside your incubator for unusual gas and temperature (Fig. 05) controlled experiments, dimensions: 12.0" (30.5cm) circular chamber, 4.7" (11.9cm) high	190043
Chamber Cooling Coil, use with refrigerated water bath/circulator to operate incubator at lower than ambient temperatures, factory installed	190645
Replacement O <sub>2</sub> Sensor	290083
IQ/OQ, MS Windows®-compatible document disk for process customization and detailed checklists to qualify unit setup and operation	6013110



Fig. 01 | Copper Humidity Pan



Fig. 02 | Inner Glass Door Kit



Fig. 03 | Two-Stage CO<sub>2</sub> Gas Regulator



Fig. 04 | HEPA Air-Filter (VOC)



Fig. 05 | Sealed Modular Incubator Chamber



Fig. 06 | Roller Dolly

## Thermo Scientific Forma Series II Water Jacketed CO<sub>2</sub> Incubators

Specifications		Shelves	
<b>Temperature</b>		<b>Dimensions</b>	
Control	±0.1°C	Dimensions	18.5" x 18.5" (47.0cm x 47.0cm)
Range	5°C above ambient to 55°C (131F)*	Construction	Stainless steel, perforated
Uniformity	±0.2°C @ 37°C (98.6F)	Surface Area	2.4 sq. ft. (0.2 sq. m)
Tracking Alarm	User-programmable high/low	Max. per Chamber	40.8 sq. ft. (3.8 sq. m)
<b>Temperature Safety</b>		Standard, Maximum	4, 17
Sensor	Precision thermistor	<b>Construction</b>	
Controller	Independent analog electronic	Water Jacket Volume	11.7 gal. (43.5 liters)
Setability	0.1°C	Interior Volume	6.5 cu. ft. (184.1 liters)
<b>CO<sub>2</sub>/O<sub>2</sub></b>		Interior	Type 304, mirror finish, stainless steel
CO <sub>2</sub> /O <sub>2</sub> Control	Better than ±0.1%	Exterior	18 gauge, cold-rolled steel, powder coated
CO <sub>2</sub> Range	0-20%	Outer Door Gasket	Four-sided, molded, magnetic vinyl
O <sub>2</sub> Range	1-20%	Inner Door Gasket	Removable, cleanable, feather-edged, silicone
Inlet Pressure	15 PSIG (1.0 bar)	<b>Electrical</b>	
CO <sub>2</sub> Sensor	T/C or IR	3110/3120/3130/3140	115V, 50/60 Hz, 3.6 FLA (Operating range 90-125V)
O <sub>2</sub> Sensor	Fuel cell	3111/3121/3131/3141	230V, 50/60 Hz, 2.0 FLA (Operating range 180-250V)
Readability & Setability	0.1%	Circuit Breaker/	6 Amps/2 Pole
Tracking Alarm	User-programmable high/low	<b>Power Switch</b>	
<b>Humidity</b>		Convenience Receptacle	75 Watts max. (one per chamber)
RH	Ambient to 95% @ 37°C (98.6F)	Plug	115V: NEMA 5-15P Plug
Humidity Pan	3.2 qt. (3.0 liters) standard		230V: CEE 7/7 Plug
Display (opt.)	In 1% increments	Alarm Contacts	Power interruption; deviation of temp, CO <sub>2</sub> , O <sub>2</sub> , RH; customer connections through jack on back of unit
<b>Fittings</b>		Data Outputs (opt.)	RS-485, 0-1V, 0-5V, 4-20 milliamp (select one)
Fill Port	3/8" hose (barbed)	<b>Dimensions</b>	
Drain Port	1/4" hose (barbed)	Exterior	26.0"W x 39.5"H x 25.0"F-B (66.0cm x 100.3cm x 63.5cm)
Access Port	1.3" (3.3cm) with removable silicone plug with filter	Interior	21.3"W x 26.8"H x 20.0"F-B (54.1cm x 68.1cm x 50.8cm)
CO <sub>2</sub> Inlet	1/4" hose (barbed)	<b>Weight</b>	
<b>Unit Heat Load</b>		Net	265 lbs. (120.2 kg)
115V/230V	344 BTUH (100 Watt)	Net Operational	365 lbs. (165.6 kg)
		Shipping (Motor)	324 lbs. (147.0 kg)

Ordering Information			
Cat. No.	CO <sub>2</sub>	O <sub>2</sub>	Voltage
3110	T/C	No	115
3111	T/C	No	230
3120	IR	No	115
3121	IR	No	230
3130	T/C	Yes	115
3131	T/C	Yes	230
3140	IR	Yes	115
3141	IR	Yes	230

### Choice of T/C or IR Sensor

Select a T/C sensor when chamber temp and RH are relatively constant. Typically, a T/C sensor has a longer life than an IR sensor. Select an IR sensor when temp and RH levels are changed frequently. With either sensor, elevated RH is critical to prevent desiccation.

All units are UL Listed to United States and Canadian requirements and bear the CE Mark. \*50°C (122F) on Model 3120 (3121), 45°C (113F) on Models 3130 (3131) and 3140 (3141)



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[www.thermo.com/incubators](http://www.thermo.com/incubators)

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