

# TechNotes

## QA

### How does the design of the covered integrated water reservoir in selected Thermo Scientific™ CO<sub>2</sub> incubators protect cultured cells by limiting contaminants in the humidity water?

Innovations designed into Thermo Scientific Heracell™ VIOS™ 160i and 250i and Thermo Scientific Forma™ Steri-Cycle™ i160 and i250 CO<sub>2</sub> incubators combine to dramatically reduce the chances of microorganisms entering and multiplying in the water, provided only sterile distilled water is used<sup>1</sup>. The unique covered integrated water reservoir with HEPA filtration protects cultured cells and saves time fighting contaminants which can colonize a standard water pan. To fight microbial contaminants growing in incubator water, many labs use germicidal additives. Importantly, our humidity system design helps to eliminate the need for chemical additives. In fact, internal tests show that this system keeps the water nearly 300% cleaner than an open reservoir or pan (tests repeated 3 times on different days). Because many chemicals can harm cultured cells and incubator components over time, this unique system is designed to provide chemical free protection.

The system includes a full cover over the integrated water reservoir to protect against microorganisms landing in the water. A pre-filter limits dust and dirt from entering via the air stream, and the HEPA filtration system, combined with the Thermo Scientific™ THRIVE™ active airflow, removes particles and contaminants from the incoming air stream. The covered integrated water reservoir is easy to drain and refill, so the sterilized distilled water<sup>1</sup> can be drained and replaced one to two times per month. If needed, the reservoir and 100% pure copper drain can be rinsed with 70% ethanol before refilling.



<sup>1</sup> Use only sterile distilled water with a pH of 7-9 and a resistivity of 50 K-1 MΩ-cm.

The covered integrated water reservoir in the Heracell VIOS and Forma Steri-Cycle CO<sub>2</sub> incubators is designed to protect cultures and to limit entry of contaminating microorganisms to the water.

Individual parts of the complete system are shown in Figure 1 and described below.

## Water reservoir is protected

The integrated water reservoir is completely covered, reducing chances that microorganisms could drop into the water. At the front of the cover is an opening allowing for the addition of fresh, sterile distilled water.<sup>1</sup> During normal use, the opening is covered by a pre-filter which helps to limit microbes carried by dust and dirt from entering the water reservoir.

## THRIVE active airflow with HEPA filtration captures airborne particles

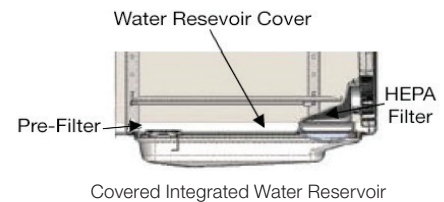
The THRIVE active airflow system gently propels the air through the pre-filter, where larger dust and dirt are caught. Air then enters the covered integrated water reservoir, passing over the water and picking up humidity and gases to condition the incubator atmosphere. Next the air flows to the H13 HEPA filter, where microscopic particles are captured before the air continues on to the incubator chamber where it passes over the sensors and then gently circulates among cell cultures. The entire chamber air circulation takes less than one minute.

## Covered integrated reservoir is easy to drain, refill and clean

To ensure microorganisms do not grow in the incubator water, replace it with fresh, sterile distilled water<sup>1</sup> each week or two. To ease this process, the covered integrated reservoir has a 100% copper drain and click-seal tubing which empties all of the water in seconds. To refill, simply remove the pre-filter, open the bottom shelf port and pour fresh water into the opening, then replace the pre-filter. This design requires no disturbance of cultures. For cleaning, the shelves and reservoir cover slide out easily, fully exposing the large reservoir (Figure 2).

## Eliminate ongoing use of germicides

Some labs struggle with fungal growth in their incubator such that they continually use chemical disinfectants in the water. Many of these chemical disinfectants have negative effects on cells, eliciting stress responses. Such chemicals can also corrode incubator components over time. But the unique design of the covered integrated water reservoir in the Heracell VIOS and Forma Steri-Cycle CO<sub>2</sub> incubators limits microorganisms. Thus, this system — combined with regular changes to fresh, sterile water — can eliminate the need to use a germicidal additive.



**Figure 1:** Heracell VIOS and Forma Steri-Cycle CO<sub>2</sub> incubators feature a complete system designed to protect water from contamination. The covered integrated water reservoir keeps microorganisms from dropping into the water. The pre-filter limits dust and dirt entering on the air stream, and the HEPA filter catches microorganisms traveling in the air.



**Figure 2:** With shelves and cover removed, the integrated water reservoir is completely accessible for easy cleaning.

## Summary:

The covered integrated water reservoir in Heracell VIOS and Forma Steri-Cycle CO<sub>2</sub> incubators is designed to protect the water, minimize microorganisms and eliminate the need for harmful germicides.

<sup>1</sup> Use only sterile distilled water with a pH of 7-9 and a resistivity of 50 K-1 MΩ-cm.

Find out more at [thermofisher.com/CO2](https://thermofisher.com/CO2)

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