

Highlighting innovative design features  
and useful application information for  
**Thermo Scientific Water Purification Systems**

**Thermo**  
S C I E N T I F I C

# smart notes

design and innovation ▶ Type 1 Water



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## Why is UV intensity monitoring important for ultrapure water?

UV intensity monitoring is an innovative technology designed to ensure that the total organic carbon (TOC) reading is accurate, providing superb reliability for ultrapure water.

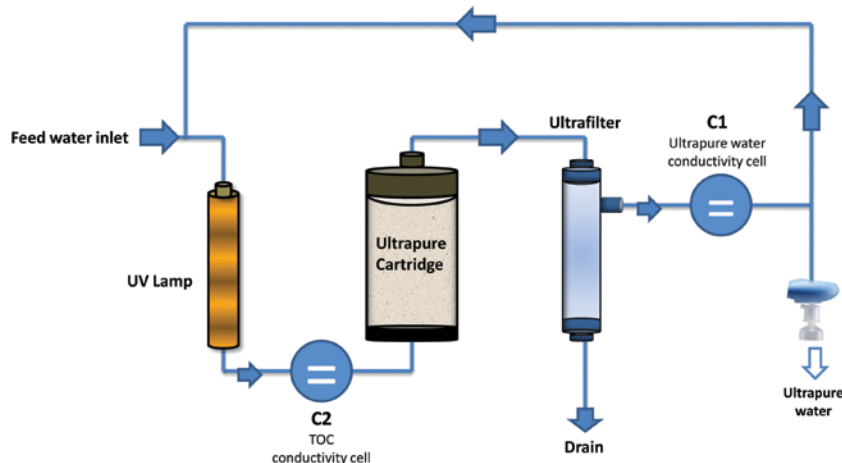
The monitoring and display of the TOC content in product water has become increasingly important as biochemical methods become more sensitive to low levels of organics. In addition to visualizing the resistivity of the ultrapure water, you need to quantify the amount of organic impurities in the water. Organic-free water is critical to applications that are sensitive to organics, such as HPLC and GC-MS. It is imperative that the TOC measurement be monitored for accuracy to prevent negative results.



# Why is UV Intensity Monitoring Important?

## TOC monitoring

TOC monitoring is a useful technology that provides a real-time measurement of the actual level of organics in the product water. Product water is regularly being sampled and tested for the level of organic impurities in the water at various intervals. To accomplish this, the conductivity (C1) of the product water is measured and the value stored in the water system's processor. During recirculation, the water is then sent through the system's UV bulb, where it is irradiated with UV light. This oxidizes any organics present in the product water. The oxidation of the organics creates ions, which are then measured by a downstream conductivity cell (C2). The amount of extra ions in the water is directly proportionate to the amount of organics in the water, if the UV bulb is working properly. The difference between the conductivity cells is calculated and a TOC value is displayed.



## UV intensity monitoring – safeguarding TOC

The accuracy of the TOC measurement depends on how well the UV bulb irradiates the water. If the bulb is not fully illuminated, the total amount of organics in the water will not be oxidized, resulting in a false reading. To protect against this, Thermo Scientific engineers created a photo electrode that directly monitors the UV lamp, and ensures that it is working properly. If there is a problem, the system is designed to display an error.

### Thermo Scientific Barnstead Type 1 water purification systems that employ this technology:

- GenPure™ system
- GenPure Pro system
- GenPure xCAD system

## Summary

If your application demands extremely low levels of organics, UV intensity monitoring can help ensure that your TOC measurements are accurate.

**Find the best Thermo Scientific Barnstead Type 1 water purification system for your application.**

**Learn more at [www.thermoscientific.com/purewater](http://www.thermoscientific.com/purewater)**

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