

Engineering Specification

Total Organic Carbon Sensor & Transmitter (Mettler-Toledo Thornton 5000TOC & 770MAX)

The Total Organic Carbon (TOC) measuring system shall be capable of measuring TOC in sample water from a pure or ultrapure water source. The system shall consist of a transmitter and 1 or 2 TOC sensor(s), as specified. Each sensor shall connect to the transmitter using a single patch cable. Each sensor shall provide continuous measurement of a single pressurized sample stream with no interruption of sample flow or measurement, with response time less than 1 minute.

The TOC sensor shall accept samples with temperature in the range 5 - 90°C, conductivity ≤ 2 $\mu\text{S}/\text{cm}$, pressure in the range 15–100 psig (1–6.9 bar) and flowrate ≥ 20 mL/min. The sensor case shall be sealed, with NEMA 4X rating and suitable for wall or pipe mounting as specified, at a distance up to 300 ft (91 m) from the transmitter. Sample flowrate shall be controlled with an integral pressure regulator.

TOC measurement shall be determined by measuring conductivity and temperature at points in the flow stream before and after irradiating the sample water with high intensity 185-nanometer ultraviolet light to oxidize organics to conductive carbon dioxide. The TOC system shall operate from a power source of 100–130 or 200–240 VAC, 50/60 Hz, as specified.

The system shall use a multichannel, multiparameter transmitter allowing up to 2 channels of TOC measurement. The transmitter shall be capable of displaying TOC, temperature, inlet resistivity and conductivity (compensated and un-compensated) from each TOC sensor channel. The transmitter shall accept 4 channels, including other parameters of conductivity, resistivity, pH, ORP, dissolved oxygen, flowrate, pressure and tank level plus 2 additional pulse input channels of flowrate, for a total of 6 sensor channels.

The transmitter shall provide a 4-line multi-page illuminated display for readout of all parameters. It shall be suitable for panel, pipe or wall mounting, as specified. The transmitter shall provide 4 or 8 4-20mA output signals as specified, configurable for TOC, conductivity, resistivity, temperature and any other parameters measured. The transmitter shall provide RS232 serial interface for configuration or data log output. It shall provide 4 SPDT alarm relays as specified.

The sensor and transmitter shall be ISO9001 factory calibrated to ASTM and NIST-traceable standards and be provided with certificates of calibration. The TOC system shall be capable of user calibration.

The system shall consist of Mettler-Toledo Thornton 5000TOC Sensor and 770MAX Multiparameter Analyzer/Transmitter.