

Shimadzu TOC-L Analyzer

Standard Operating Procedure



 **SHIMADZU**
Excellence in Science

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1 Introduction

The Shimadzu TOC-LCPH/CPN (TOC) instrument measures the total amount of carbon (TC), inorganic carbon (IC), the total amount of organic carbon (TOC) and the total amount of non-purgeable organic carbon (NPOC). The TOC works on the principle of oxidative combustion infrared (IR) analysis. The carbon samples are combusted to form CO₂(g) and analyzed in a non-dispersive infrared analyzer (NDIR).

2 Purpose

The purpose of this document is to introduce the user to the routine operation of the Shimadzu TOC-L. This document also outlines the special safety concerns introduced when using the instrument.

3 Scope

This protocol applies to established procedures of analysis using the standard configuration. Individuals must complete a training session.

4 References

- Total Organic Carbon Analyzer TOC-L cph/cpn – User's Manual (638-94602H)
- Solid Sample Module for TOC-L Series SSM-5000A – User's Manual (638-94608)

5 Equipment

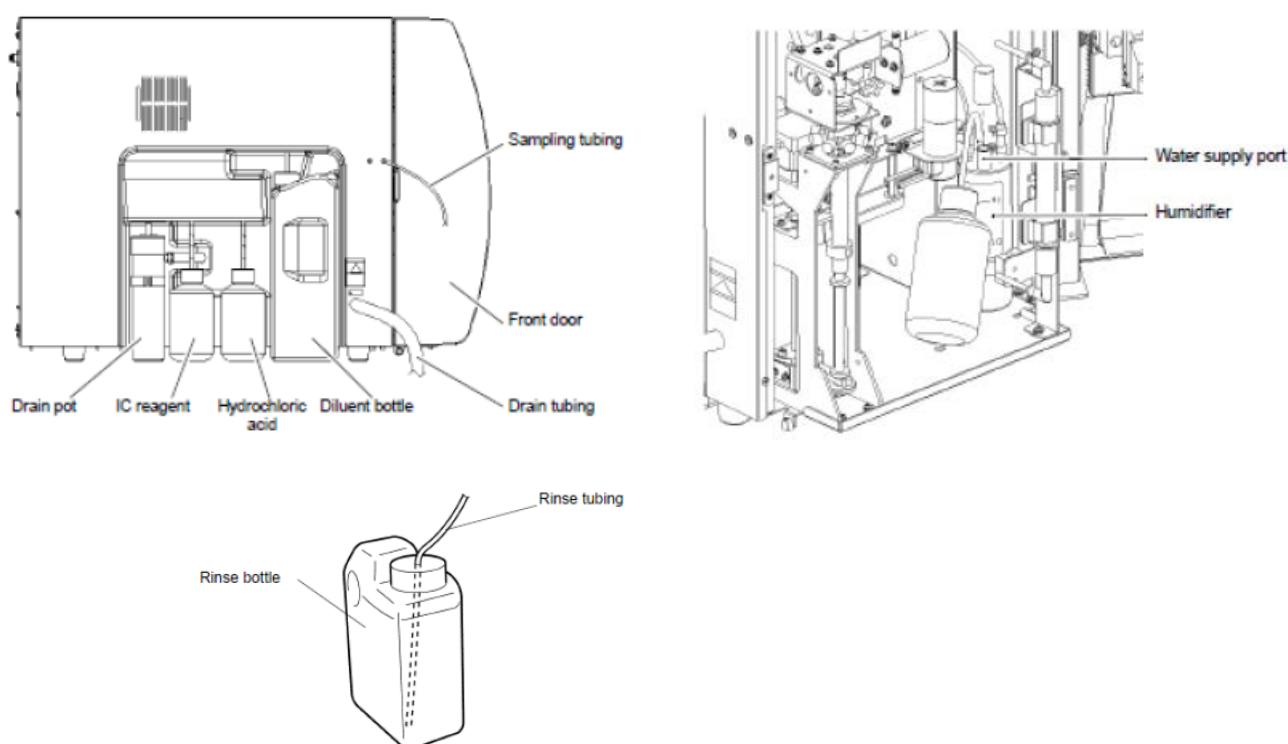
- Total Organic Carbon Analyzer TOC-L csh
- SSM-5000A Solid Sample Module
- ASI-L Auto-sampler unit

6 Safety

- The TOC Analyzers uses very high temperatures (680 °C)
- The SSM Module uses very high temperatures (900 °C and 200 °C)
- Oxygen and Zero air Cylinders are at high pressure

7 Initial Setup

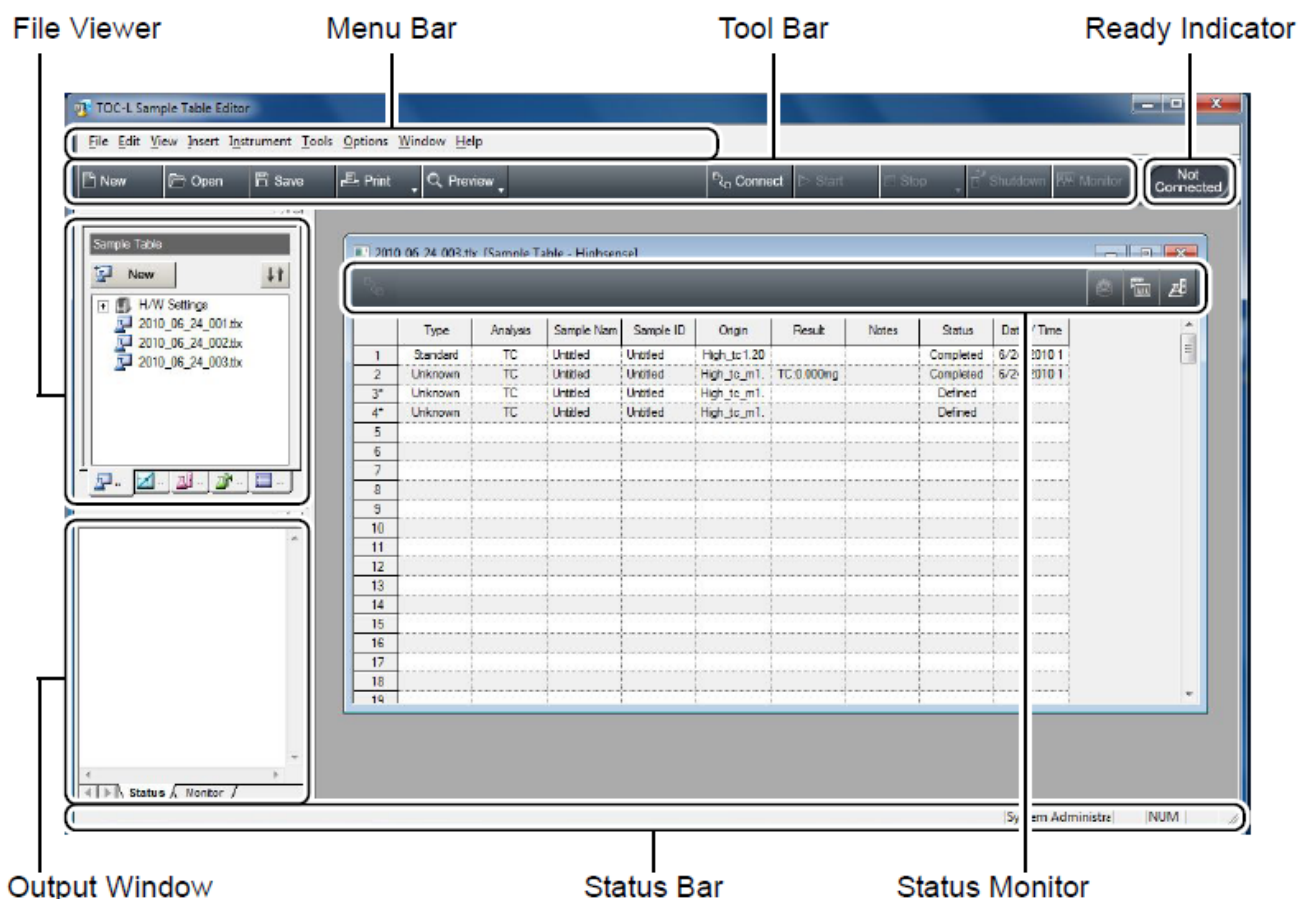
1. Open the gas cylinders valves and make sure they are full.
2. Open the gas regulators, the delivery pressure for the oxygen and the zero air cylinders should be between 200 to 300 KPa and 300 KPa respectively.
3. Verify there is enough water in the dilution bottle.
4. Verify there is enough acid for analysis in the acid bottle.
5. Make sure the drain pot is full, fill it if necessary.
6. Check the level of water in the humidifier, fill it if necessary.
7. Check the Rinse Bottle of the ASI-L, fill it if necessary.
8. Verify for that the tubing of the dilution bottle, the acid reagents, and the rinse bottle.
9. Turn on all the modules.



8 Startup

1. Start the TOC-Control L software.
2. Click the "Sample Table Editor".
3. Login with the password if enabled.
4. Open a new table or open a recent one.
5. Choose a Hardware setting depending on the hardware needed, for example you may select to use the SSM with the TOC-L, or the TOC-L with the ASI.
6. Click the "Connect" button from the Toolbar.
7. Wait for the system to get "Ready".





8. You may check the instrument parameters such as the flow, pressure, temperatures, baseline, etc. from the “Monitor” Button.
9. Once the instrument is “Ready”, the Ready indicator will turn to green.
10. You may now start running samples using methods and calibration curves.
11. To learn more about running samples, creating methods and calibration curves, refer to the manuals mentioned in the “References” Section, those manuals are provided when the instrument is installed.
12. Always refer to Shimadzu representative in case of errors or malfunctions.

9 Shutdown

1. To turn off the instrument, you have to shutdown the instrument by clicking the “Shutdown” button from the toolbar.
2. A window will pop up, choose “Shutdown instrument” and click OK.
3. The furnace is switched off, carrier gas flow is stopped and 30 minutes later, power to the instrument is switched off (although the main power remains on).
4. It is extremely important not to cut the power before the shutdown is finished, this will cause damage to the internal parts of the analyzer.