

Model C680

High-Temperature Combustion TOC Analyzer

Accurate TOC, TC, IC, and
NPOC Measurement for
Water Quality Testing

The Blue Dragon Model C680 combines 680°C catalytic combustion with NDIR detection to deliver reliable organic carbon analysis across environmental, pharmaceutical, industrial, utility, and laboratory applications.



680°C
Catalytic
Combustion



NDIR
CO₂
Detection



**TOC / TC /
IC / NPOC**

Why TOC Analysis Matters

Water quality, process control,
and regulatory confidence.

Total Organic Carbon (TOC) is a key indicator of organic contamination in water. Accurate TOC measurement helps laboratories and industrial users monitor water quality, verify cleaning effectiveness, support compliance, and control process performance across a wide range of water matrices.



1 Why TOC Matters

- Tracks organic contamination in water
- Supports quality control and regulatory monitoring
- Helps verify purified water and cleaning processes
- Improves confidence in laboratory and industrial decisions



2 Why Choose the Model C680?

- 680°C catalytic combustion technology
- NDIR CO₂ detection for stable measurement
- Measures TOC, TC, IC, and NPOC
- Application-dependent range up to 100,000 mg/L
- Designed for water quality laboratories



3 Typical Water Types



Purified water



Ultrapure water



Drinking water



Surface water



Groundwater



Municipal wastewater



Industrial wastewater



Process water



Typical Industries



Environmental
Monitoring



Water Utilities
& Sewage



Pharmaceutical
& Food



Chemical
& Power



Industrial
Wastewater



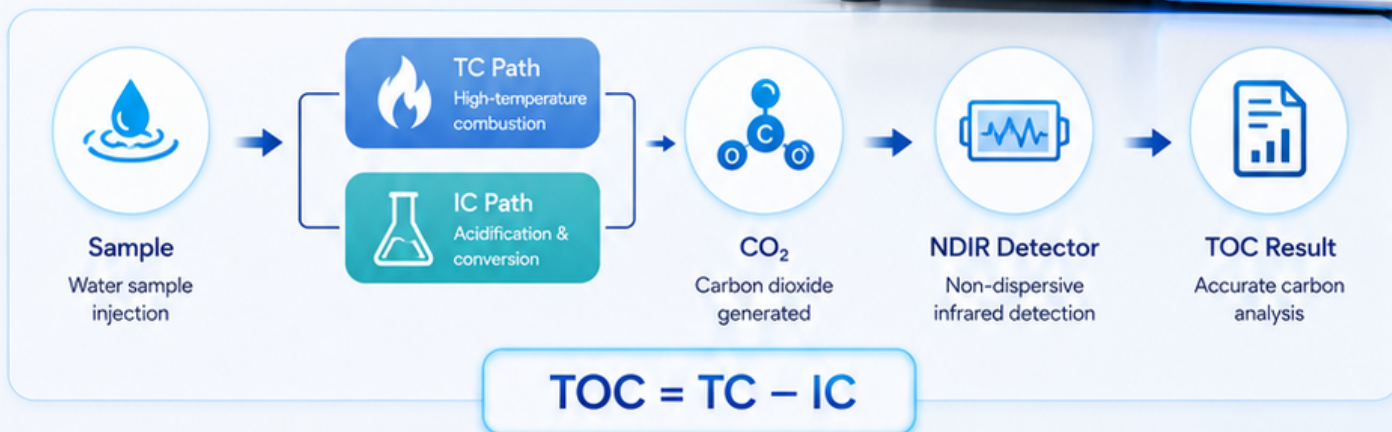
Research &
Testing Labs



Technology Overview

Simple, reliable combustion TOC analysis

The Model C680 uses high-temperature catalytic combustion and non-dispersive infrared (NDIR) detection to quantify carbon in water samples. The analyzer separately determines Total Carbon (TC) and Inorganic Carbon (IC), then automatically calculates TOC as $TOC = TC - IC$. It also supports NPOC analysis for broader laboratory flexibility.



01

TC Measurement

A water sample is injected into the TC path and oxidized in the high-temperature furnace. Organic and inorganic carbon are converted to CO₂ for measurement.



02

IC Measurement

A sample is injected into the IC reactor, acidified, and inorganic carbon is converted to CO₂ for separate detection.



03

TOC Calculation

The analyzer calculates total organic carbon automatically from the relationship $TOC = TC - IC$.



04

NPOC Mode

For NPOC analysis, inorganic carbon is removed before combustion so the remaining organic carbon can be measured accurately.



680°C
catalytic
combustion



NDIR
CO₂
detection



Automatic
TOC
calculation

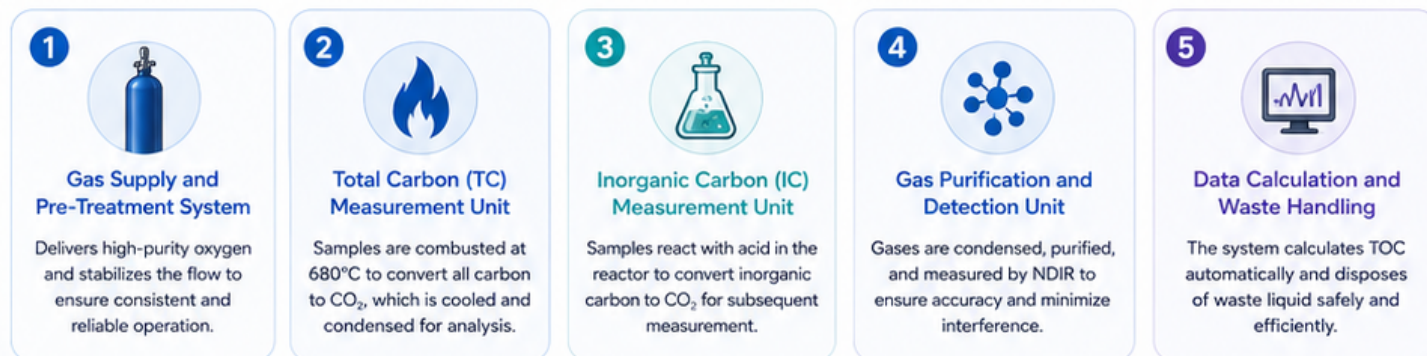
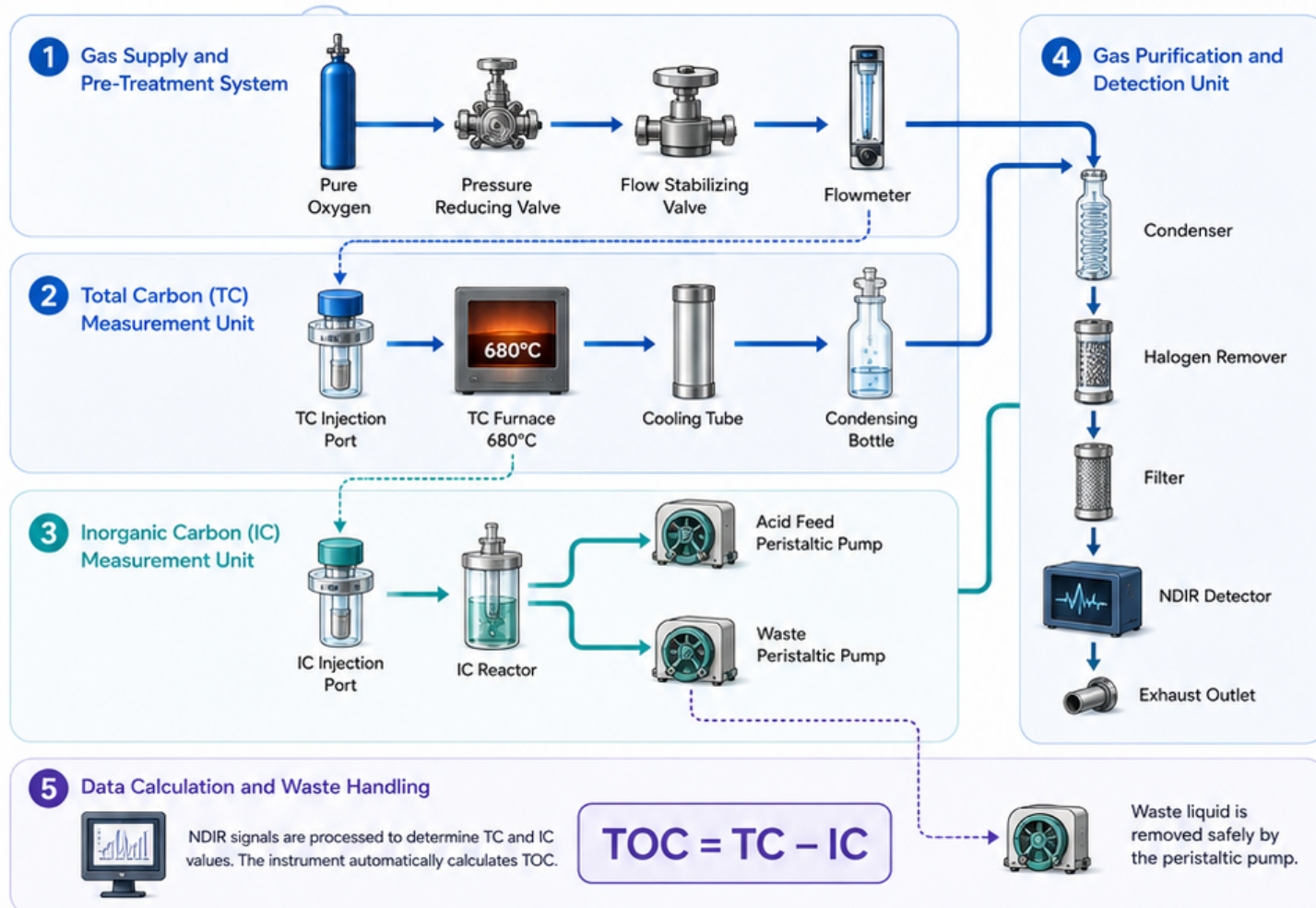


Multi-mode
carbon
analysis

Working Principle

From sample introduction to TOC result

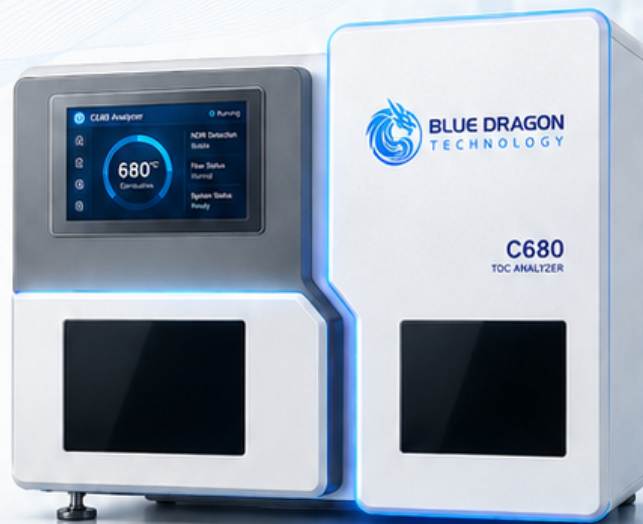
The Model C680 uses two analytical paths. In the TC path, carbon in the sample is fully oxidized to CO_2 in the combustion furnace. In the IC path, inorganic carbon is converted to CO_2 in the acidified reactor. The resulting gases are purified and measured by NDIR detection, and the instrument calculates TOC automatically.



Analytical Performance

Reliable capability for laboratory water analysis

The Model C680 combines a wide analytical range, low detection limit, stable repeatability, and strong linearity to support demanding water quality applications in environmental, pharmaceutical, industrial, and research laboratories.



Measurement Range
Up to 100,000 mg/L,
application-dependent



Detection Limit
 ≤ 0.5 mg/L



Repeatability
 $\leq 3\%$



Linearity
 $R^2 \geq 99.9\%$



Injection Volume
10–500 μ L



Response Time
4–10 minutes



Measurement Modes



TOC
Measures total organic carbon for overall organic load assessment.



TC
Measures total carbon, including organic and inorganic carbon.



IC
Quantifies inorganic carbon for carbonate and bicarbonate analysis.

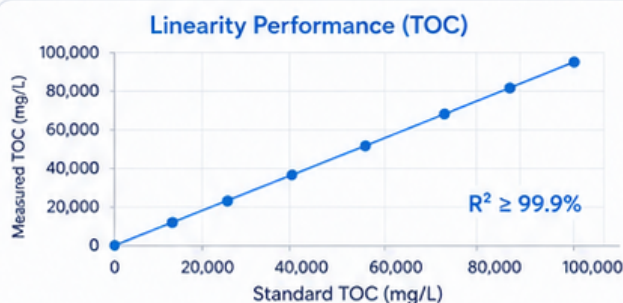


NPOC
Measures non-purgeable organic carbon for dissolved organic compounds.



Performance Highlights

- ✓ Dual-path TC/IC analysis
- ✓ Stable NDIR CO_2 detection
- ✓ Complete catalytic oxidation at 680°C
- ✓ Suitable for low- and high-level carbon measurement
- ✓ Designed for repeatable water quality testing



Measurement Workflow



Sample Injection
10–500 μ L



Catalytic Combustion
680°C



NDIR CO_2 Detection
Stable & Accurate



Data Analysis & Reporting
Reliable Results

Applications & Water Matrices

Designed for diverse laboratory and industrial water testing needs.

The Model C680 is suitable for TOC analysis in purified water, drinking water, environmental water, municipal wastewater, industrial wastewater, and other process water matrices. Its versatility makes it valuable across routine monitoring, compliance testing, and research workflows.



1. Environmental Monitoring

Routine monitoring of surface water, groundwater, drinking water sources, and wastewater from key pollution sources.



2. Urban Water Supply & Sewage

Raw and treated water, municipal pipeline water, and influent/effluent monitoring for sewage treatment plants.



3. Pharmaceutical & Food

Compliance testing of purified water, water for injection, and production cleaning wastewater.



4. Chemical & Power

TOC measurement in cooling water, boiler feedwater, process wastewater, and complex matrix samples.



5. Industrial Wastewater

Monitoring organic contamination in high-load and variable wastewater streams.



6. Research & Analysis

Quantitative analysis for water treatment studies and organic pollutant transformation experiments.

Typical Water Matrices



Purified Water



Ultrapure Water



Drinking Water



Surface Water



Groundwater



Process Water



Municipal Wastewater



Industrial Wastewater



Broad matrix compatibility



Reliable results across complex samples



Trusted data for compliance, operations, and research

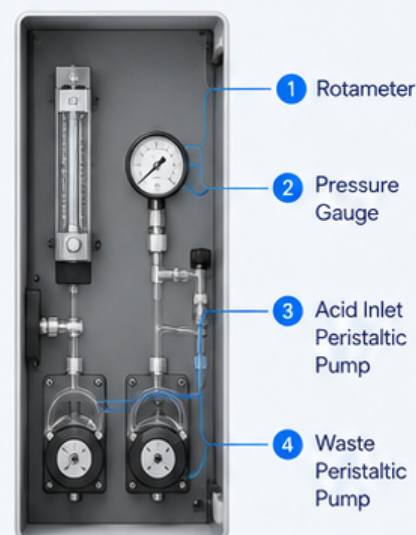


System Components & Instrument Design

Built for reliable bench-top laboratory operation



IC Operation Chamber



Design Highlights

-  Compact bench-top footprint
-  Integrated TC and IC analytical paths
-  Touchscreen operation
-  Stable gas-flow management
-  Designed for routine laboratory use

Front View



Rear View



Side View



Top View



Operation, Software & Calibration

Efficient workflow for daily laboratory use

After startup and preheating, the Model C680 provides a clear touchscreen workflow for testing, calibration, time setting, and historical data review. The interface is designed to simplify routine measurement tasks and support repeatable laboratory operation.



01 Startup & Preheating

Confirm gas supply, power on the system, and allow the furnace and detector to reach stable operating conditions.



02 Test Selection

Choose TOC, TC, IC, or NPOC based on the sample and application requirement.



03 Calibration

Set or edit TC and IC calibration curves to support accurate quantification.

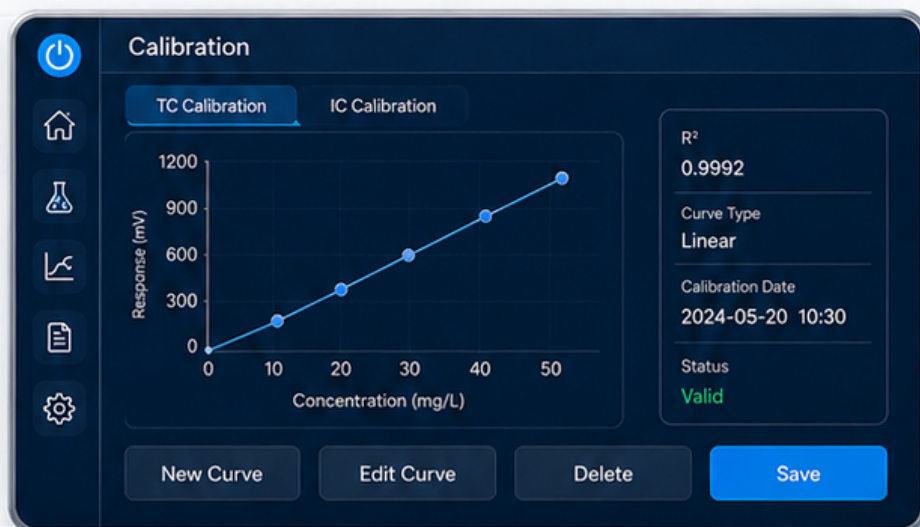


04 Historical Data

Review stored results and operating records for traceability and laboratory management.

Calibration Functions

- ✓ TC and IC calibration support
- ✓ Curve creation and editing
- ✓ Touchscreen parameter entry
- ✓ Manual sample injection workflow



Installation & Operating Requirements

Practical setup conditions for dependable analysis

The Model C680 is designed for indoor bench-top installation with clear operating requirements to support stable measurement performance and safe laboratory use.

Requirement	Specification
 Ambient Temperature	10–40°C
 Relative Humidity	10–85%
 Installation Location	Indoor; maintain at least 20 cm clearance on all sides
 Power Supply	220–240 VAC, 50 Hz, reliable grounding required
 Power Consumption	1200 W during furnace heating
 Ultrapure Water	CO ₂ -free water, TOC ≤ 0.1 mg/L
 Acidifying Agent	0.1 mol/L phosphoric acid
 Gas Supply	High-purity oxygen ≥99.99%, with initial pressure-reducing valve
 Sample Injection Method	Manual injection



Operational Notes

- ✓ Check gas lines for leaks before startup
- ✓ Allow furnace and detector to preheat fully
- ✓ Maintain clean consumables and catalyst condition
- ✓ Keep adequate ventilation and clear surrounding space



Stable Environment
10–40°C



Controlled Humidity
10–85% RH



Clear Space & Ventilation
≥20 cm



Safe & Reliable Operation
For Lab Use

Technical Specifications

Model C680 High-Temperature Combustion TOC Analyzer

 Measurement Principle	High-temperature catalytic combustion + NDIR
 Measurement Modes	TOC, TC, IC, NPOC
 Combustion Furnace	680–1000°C
 Injection Volume	10–500 µL
 Measurement Range	Up to 100,000 mg/L, application-dependent
 Detection Limit	≤0.5 mg/L
 Repeatability	≤3%
 TC Indication Error	±0.1% F.S. or ±5% (whichever is greater)
 IC Indication Error	±0.1% F.S. or ±4% (whichever is greater)
 Linearity	$R^2 \geq 99.9\%$
 Response Time	4–10 minutes
 Sample Injection	Manual injection
 Carrier Gas	High-purity oxygen ≥99.99%
 Power Supply	220–240 VAC, 50 Hz



Why Blue Dragon Technology

-  Professional analytical solutions
-  Reliable laboratory performance
-  Clear technical support and documentation
-  Designed to support quality control and compliance



For quotations, distributor enquiries, and technical documentation, contact **Blue Dragon Technology**.



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