

astroTOC™ UV TURBO Total Organic Carbon Analyzer

Features and Benefits

Designed for a Variety of Industrial Applications

Chemical manufacturers, petrochemical plants, and electric utilities require large volumes of clean steam. Use the Hach astroTOC UV TURBO Total Organic Carbon (TOC) Analyzer to continuously monitor the steam in co-generation arrangements after use in one facility and before it reaches turbines/equipment of the partner facility. The astroTOC UV TURBO analyzer is also recommended for semiconductor applications to measure TOC levels in recycle/reclaim water, pharmaceutical applications and other purified water applications.

Fastest True TOC Analyzer with Accurate Performance

The astroTOC UV TURBO analyzer is fast—accurate results are made in five minutes. Other analyzers that measure TOC with differential conductivity can be inaccurate because two measurements must be made (total carbon (TC) and total inorganic carbon (TIC)). The astroTOC UV TURBO analyzer removes the TIC from the sample so it only measures true TOC as described by ASTM, EPA, ISO, and Standard Methods. High levels of TOC do not require increased analysis time because samples are monitored continuously.

Proven NDIR Technology

ASTM, EN, EPA, ISO and Standard Methods recommend TOC analysis methods using NDIR detection. Using NIST traceable gas standards, the NDIR detector provides a stable TOC measurement. The zero or baseline is adjusted every time the instrument is calibrated, which increases measurement stability and avoids drift. Each NDIR detector must endure a stringent two-week stability test before it leaves the factory, ensuring a robust, stable detector.

Multi-point Calibration Compensates for Background TOC

On-site calibrations can be made at any time to avoid downtime. An advanced calibration utility offers a multi-point (up to ten) calibration. The TOC-added calibration compensates for the TOC background usually found in make-up water. This type of calibration is necessary when measuring low levels when the unknown carbon species in the DI water is significant. The analyzer calculates the calibration curve slope and adjusts the slope so the line is forced through zero, allowing accurate low-level measurements.



The Hach astroTOC UV TURBO Total Organic Carbon Analyzer is the fastest true TOC analyzer with accurate performance. Sample composition and oxidation by-products will not interfere with measurements. It also offers advanced diagnostics and other features designed for easy use.

Spacious, Robust Enclosure

The large two compartments that house the electronics and fluidics make maintenance easy. An IP66/NEMA 4 rated enclosure withstands harsh industrial environments. The dual compartments ensure that any leaks in the fluidic system will not damage the electrical components.

Easy to Use Advanced Diagnostics and Features

Advanced diagnostics monitor general system conditions—including loss of sample flow, loss of carrier gas, pump tube deterioration, and a programmable process spill threshold, which protects the analyzer from fluid blockage and pollution due to over-range conditions. User-assigned relays can be used to select diagnostics or system functions. Auto-cleaning, auto-validation, and auto-calibration can be scheduled. Validation is a simple single-point QA/QC check to assess system performance.

Total Organic Carbon

WW

IW

DW = drinking water WW = wastewater municipal PW = pure water / power
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

Specifications*

Range

0 to 50,000 µg/L (0 to 50 mg/L)

Accuracy/Repeatability/Linearity

≤ ±4% of reading or 8 µg/L (whichever is greater) at 25°C (77°F)**

**Performance specifications established with range configuration 0 to 5000 µg/L (0 to -5 mg/L)

Minimum Detection Limit

≤ 5 µg/L for range 0 to 5000 µg/L at 25°C (77°F)***

***MDL established per EPA Appendix B to part 136

Response Time

T90 ≤ 5 minutes

T20 ≤ 3 minutes (includes TIC sparging)

Inlet Pressure

0.15 to 6 bar (2 to 87 psig)

Flow Rate

25 to 200 mL/minute

Sample Temperature Range

2° to 70°C (36° to 158°F)

Extended Inlet Temperature

2 to 100°C (212°F) with a 3000 mm (120 in.) long, 6 mm (1/4 in.) O.D. stainless steel sample inlet tube at a flow rate of 25 to 60 mL/minute

Operating Temperature Range

5 to 40°C (41 to 104°F)

Recorder Outputs

Two 4-20 mA analog outputs selectable for sample concentration, analyzer system warning or auto range indication

Alarms

Five relays selectable for sample concentration alarm, analyzer system warning or analyzer system shutdown alarm. Each is equipped with an SPDT relay with contacts rated for 3A resistive load at 250 Vac or 0.5 A at 30 V

Optional Serial Communication

One multi-function RS232 or RS485 serial port (MODBUS, CSV)

Power

115/230 Vac 50/60 Hz (switch selectable)
300 VA maximum

Sample Inlet/Outlet Connection

1/4-inch OD tube, compression fitting

Samples

Single stream, fast loop inlet (optional: Dual-stream)

Drain Connection

1-1/2-inch OD standard drain pipe

Drain Pressure

Ambient

Carrier Gas

1/8-inch OD tube, compression fitting

Clean, CO₂ free air at 2.8 bar (40 psig) minimum to 3.8 bar (55 psig) maximum (3.1 bar (45 psi) recommended)

Compliance/Certification

CE certified, listed to UL and CSA safety standards by ETL Standard Methods 5310 C, EPA 415.1

Enclosure

Cold rolled steel epoxy powder coated, IP66/NEMA 4

Optional stainless steel, IP66/NEMA 4

Mounting

Wall mount

Dimensions

981 x 675 x 220 mm (38.6 x 26.6 x 8.7 in.)

Shipping Weight

54 kg (120 lb.)

*Specifications subject to change without notice.

Principle of Operation

The Hach astroTOC UV TURBO TOC Analyzer combines chemical and ultraviolet oxidation techniques in a low-temperature reactor to deliver direct TOC measurements. It uses a multi-staged UV oxidation reactor and a chemically impervious non-dispersive infrared (NDIR) CO₂ detector system, assuring full compliance with Standard Methods 5310 C and EPA method 415.1.

The sample is mixed with acid, converting the total inorganic carbon (TIC) into CO₂. The TIC sparger removes all the CO₂

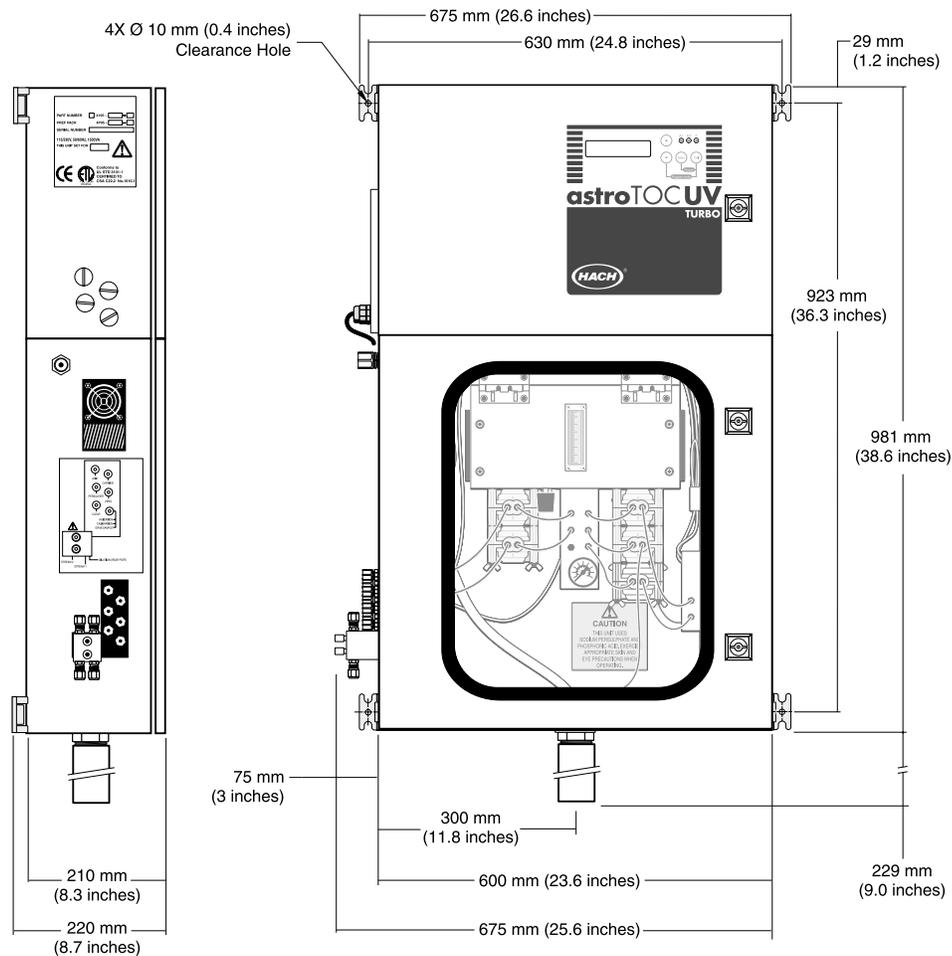
from the sample solution. Subsequently, the TIC-free sample is drawn at an accelerated rate, mixed with sodium persulfate, and routed through the UV reactor. The residence time in the UV reactor is optimized to assure full oxidation of the TOC into CO₂. The gas/liquid mixture is transported by the carrier gas into the gas-liquid separator (GLS), where the sample gas is separated and diverted into the NDIR detector for the direct, interference-free CO₂ measurement. The resulting CO₂ concentration measurement is directly proportional to the original TOC concentration found in the sample.

Engineering Specifications

- The TOC analyzer shall employ UV/persulfate oxidation utilizing a multi-staged UV-Reactor coupled with a NDIR CO₂ detection system to measure TOC in less than 5 minutes (T90).
- The analyzer shall consist of dual enclosures with analytical/electrical separation.
- There shall be two UV lamps in the multi-staged UV reactor.
- The enclosure shall be epoxy powder-coated cold rolled steel, rated IP66/NEMA 4.
- The analyzer shall be compliant with standard methods 5310 C and EPA method 415.1.
- The analyzer shall provide grab sample and validation utilities for unknown sample or reference standard measurement.
- The analyzer shall provide user programmable auto calibration, auto validation, and auto cleaning.
- The analyzer shall provide loss of sample flow and reactor feed detection.
- The analyzer shall include a hinged pump assembly module.
- The analyzer shall include two 4-20 mA parameter mapped analog outputs.
- The analyzer shall include user programmable auto ranging over four ranges.
- The analyzer shall include 5 V free function mapped relay outputs.
- The analyzer shall include one optional RS232 or RS485 serial communication output (ModBUS, CSV).
- The analyzer shall be CE certified, listed to UL & CSA Safety Standards by ETL.
- The analyzer shall be the astroTOC UV TURBO Total Organic Carbon (TOC) Analyzer manufactured by Hach Company.

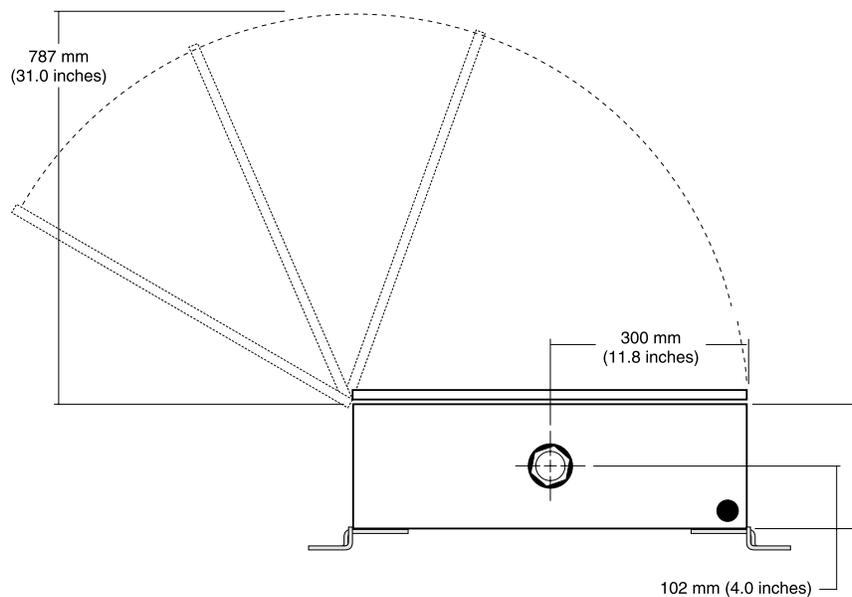
Dimensions

The Hach astroTOC UV TURBO TOC Analyzer is designed to be wall-mounted easily with four 10 mm (3/8-inch) screws. Adequate clearance must be left at the sides and bottom of the enclosure for plumbing and electrical connections. The sample inlet connection is 6 mm (1/4-inch) OD tube compression fitting and the drain connection is 1-1/2-inch OD standard drain pipe. Electrical connections are inside the instrument. Four thru-holes for 1/2-inch utility conduit fittings or four PG13.5 strain relief fittings are provided.



SIDE VIEW

FRONT VIEW



BOTTOM VIEW

Ordering Information

All Hach astroTOC UV TURBO TOC Analyzers are built with two UV lamps and are shipped with a start-up kit and a manual. Please select both an analyzer and a preference package part number from below.

Analyzers

Cold Rolled Steel Enclosure	Stainless Steel Enclosure	astroTOC UV TURBO Analyzer
H -4195-1002	H -4195-3002	0 to 2000 µg/L
H -4195-1005	H -4195-3005	0 to 5000 µg/L
H -4195-1006	H -4195-3006	0 to 10000 µg/L
H -4195-1007	H -4195-3007	0 to 25000 µg/L
H -4195-1008	H -4195-3008	0 to 50000 µg/L

Preference Packages (Cold Rolled Steel Enclosure)

115V	230V	Description
4P95-1000-00	4P95-2000-00	Basic Unit (no extra charge)
4P95-1001-00	4P95-2001-00	Level Detection Kit
4P95-1010-00	4P95-2010-00	Additional UV Lamp
4P95-1011-00	4P95-2011-00	Additional UV Lamp/Level Detection Kit
4P95-1100-00	4P95-2100-00	View Window
4P95-1101-00	4P95-2101-00	View Window and Level Detection Kit
4P95-1110-00	4P95-2110-00	View Window and Additional UV Lamp
4P95-1111-00	4P95-2111-00	View Window, Additional UV Lamp, and Level Detection Kit

Preference Packages (Stainless Steel Enclosure)

115V	230V	Description
4P95-1300-00	4P95-2300-00	View Window (no extra charge)
4P95-1301-00	4P95-2301-00	View Window and Level Detection Kit
4P95-1310-00	4P95-2310-00	View Window and Additional UV Lamp
4P95-1311-00	4P95-2311-00	View Window, Additional UV Lamp, and Level Detection Kit

Accessories

120161	Free-standing Rack Assembly
200123	1 Yr. Spare Parts Kit
200124	2 Yr. Spare Parts Kit
6948600	Kalrez O-ring Kit
4300-0003	AAS 300 CO ₂ Air Purifier with Pneumatic Timer, for use with compressed air
4000-0011	Z-Purge Kit (for installing in hazardous locations)
4200-1004	PS200 Blowback Filter with 25 µm filter (FM rated)
4200-1002	PS200 Blowback Filter with 50 µm filter (FM rated)
4200-1001	PS200 Blowback Filter with 100 µm filter (FM rated)
4200-1003	PS200 Blowback Filter with 300 µm filter (FM rated)
4200-1005	PS200 Blowback Filter with 500 µm filter (FM rated)
4300-0005	Purge Gas Generator, 120/240 VAC
4300-0006	Purge Gas Generator with compressor, 120V
200130	Pneumatic Condenser Cooler (for installing in hazardous locations)
200137	Dual Stream Retrofit Kit (adding dual stream option to existing analyzer)

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.

At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...

Keep it pure.

Make it simple.

Be right.

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Be Right™