

TOC Evolution $\nu\nu\nu$

Complete two-stage measurement of TOC. Detection of organic carbon (OC) with simultaneous and direct measurement of various TOC groups by oxidation and measurement of the produced CO_2 (NDIR).

Reliable and accurate for various applications including potable water per EN DIN 1484.



Quick response time -
5 to 8 minutes per TOC determination



Easily accessible peristaltic pump
modules and quick tubing renewal



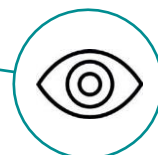
Low maintenance,
low operation cost



Automatic zero-point detection
for highest data integrity



Oxidation and stripping by the
integrated reactor - less than 3
liters of oxidant reagents consumed
per month



10 ppb LOD for reliable results in
low measuring ranges

Total Organic Carbon (TOC)

0-2 to 0-5 ppm (LOD = 10 ppb)
0-10 to 0-100 ppm (LOD = 100 ppb)
>100 to 0-1000 ppm (with dilution)

Total Inorganic Carbon (TIC)

0-100 ppm

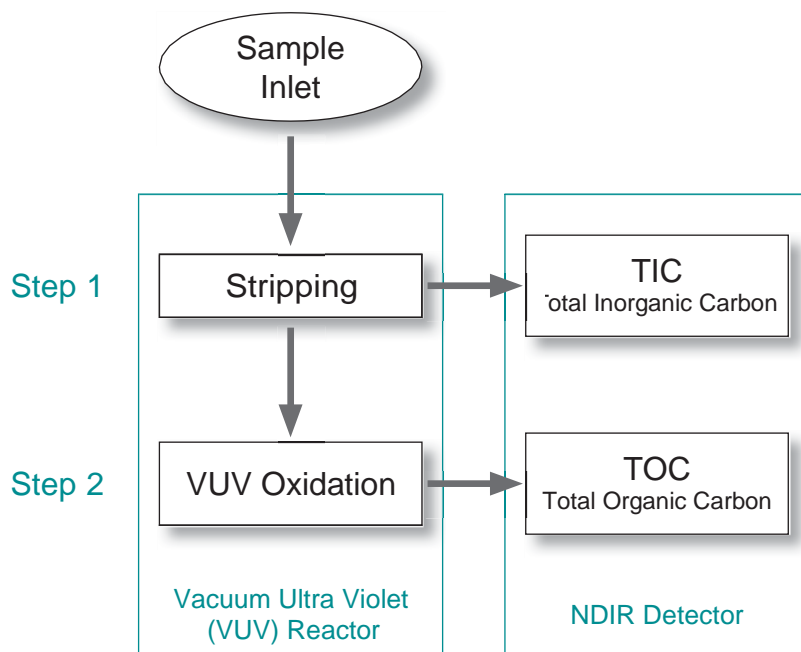
Total Carbon (TC)

0-5 ppm or 0-30 ppm

Chemical Oxygen Demand (COD)

by correlation (optional)

TOC Evolution _{VUV}



Range of Applications

Industrial Process Condensate

Early warning for leakages in water steam cycles. Determinate contamination reliably to avoid costly system damages.

Potable water treatment and surface water

Accurate and fast detection of natural organic matter (NOM), disinfectants and possible disinfection byproducts (DBPs).

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Complete monitoring system for the automatic, continuous measurement of Total Organic Carbon (TOC) and in potable water and return condensate.

Analyzer TOC Evolution VUV

- Available configurations for specific measuring ranges:

Low-range	0 to 2 ppm	LOD: 0.01 ppm
Mid-range	0 to 10 ppm	LOD: 0.1 ppm
High-range	0 to 100 ppm	LOD: 0.5 ppm
- Complete system including measurement and control electronics, measuring unit, flow indicator, oxidation reactor and reagent dosing system.
- For the continuous online determination of TOC per ISO 8245 and NFEN 1484
- Robust, high quality analyzer cabinet painted stainless steel, 316.
- Analysis time 5 to 10 minutes, programmable interval
- Determination of chemical oxygen demand (COD) by correlation.
- Automatic, electrical zero measurement prior to each measurement cycle.
- Automatic cell cleaning.
- 2 analog and 4 digital outputs for alarms for process values and diagnostic alarms for each sample stream.



TOC Evolution VUV

Order Nr.	TOC Evolution VUV (0-2 ppm, 0.01 ppm Detection Limit, 110 VAC)	SOL-59.110.010
Order Nr.	TOC Evolution VUV (0-10 ppm, 0.1 ppm Detection Limit, 110 VAC)	SOL-59.110.020
Order Nr.	TOC Evolution VUV (0-100 ppm, 0.5 ppm Detection Limit, 110 VAC)	SOL-59.110.030
Configuration	RS485 Modbus/JBUS Output	SOL-81.420.010
Configuration	Ethernet Interface (TCP/IP) Mention at order: automatic or fixed IP-address	SOL-81.420.020
Configuration	Tangential filtration <i>Setup:</i> single-channel <i>Requirements:</i> Air supply: 7 bar, clean and dry air Sample flow: 200-500l/h, 0.5 to 1 bar	SOL-82.830.020 Consult Sales
Configuration	Auto-calibration	SOL-83.520.010
Configuration	COD indication on display by correlation	Consult Sales
Configuration	2 nd -channel setup (similar range)	SOL-83.590.010
Option	1-Year Spare Part Package "Basis" (Analyzer + 1 st channel)	SOL-84.110.010
Option	1-Year Spare Part Package "Multi-Channel" (add once if multi-channel config. was selected)	SOL-84.110.020
Option	SS316L reagent shelf	SOL-89.610.010

TOC Measurement

UV/VUV + Persulfate advanced oxidation process; By purging the sample after adding acid, the IC is converted to CO₂ and completely extracted from the sample. The sample is injected into the oxidation reactor. UV directly oxidizes the organic matter which turns into CO₂. The CO₂ produced is then detected by an NDIR detector (non-dispersive infra-red).

Reaction time 5-10 min.

Sensors/Measurement Equipment

Oxidation reactor with VUV lamp
NDIR detector

Analyzer Measuring range

Low-range configuration 0-2 ppm
Limit of Detection 0.01 ppm
Repeatability $\pm 2\%$ FS
Accuracy $\pm 3\%$ FS

Mid-range configuration 0-10 ppm
Limit of Detection 0.1 ppm
Repeatability $\pm 2\%$ FS
Accuracy $\pm 3\%$ FS

High-range configuration 0-100 ppm
Limit of Detection 0.5 ppm
Repeatability $\pm 2.5\%$ FS
Accuracy $\pm 3\%$ FS

Automatic baseline adjustment.
Sample flow surveillance.

Specifications and Functionality

Pump type peristaltic
Pump quantity 2

Power supply

Voltage: 110 (configuration) or 230 VAC
Frequency: 50 /60 Hz
Power consumption: max. 300 VA

Operation

Display: Color LCD, 7", touch-screen

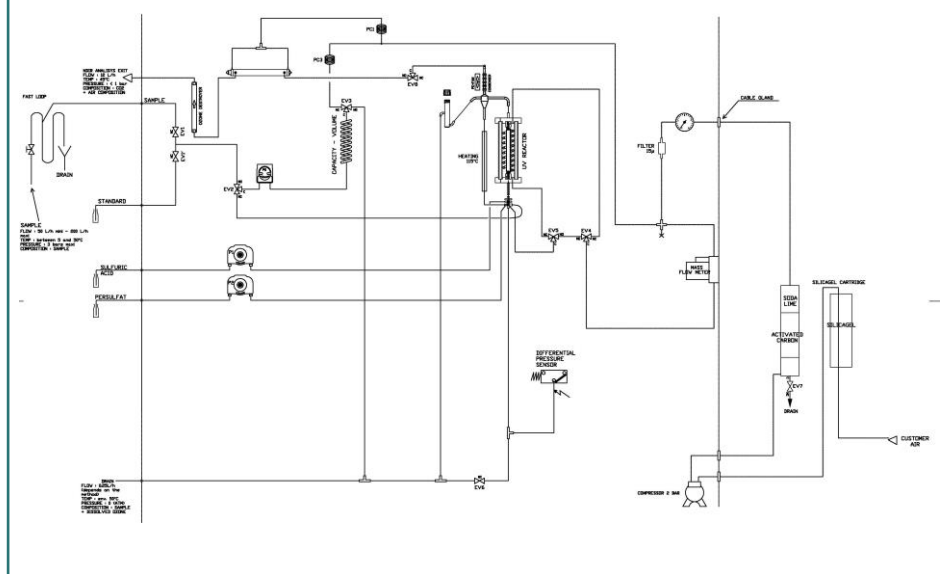
Display of process value, alarm status and time during operation.

Smart and intuitive interface based on separate menu sections: "Measure", "Diagnostic" and "Tools".

User menus in English and French.

Password protection and storage of data records. Storage and graphical display of measurement history.

TOC Evolution VUV Measurement Scheme



Alarm Relays

1 summary alarm for "analyzer failure"

Maximum load: 1A / 24 V

Relay Outputs

2 potential-free contacts for each channel programmable as limit switches for measuring values (high/low thresholds)
1 sample flow alarm for each channel

On request only:

1 output "End of cycle indication" of the active sample stream for each channel. Replaces output "Threshold No. 2".

On request only:

1 output for maintenance/calibration indication. For auto-calibration [SOL-83.520.010] only. Replaces output "Threshold No. 2".

Rated load: 1A / 24 V

Signal inputs (on request only)

1 input for "Command of stopping at end of cycle".

Signal outputs

2 programmable signal outputs for measured values (freely scalable, linear).

Current loop: 4 - 20 mA

Communication interface

RS485 interface (galvanically separated) with Modbus/JBUS RTU protocol.

Ethernet interface (TCP/IP) optional.

Analyzer Data

Sample conditions (standard configuration)

Flow rate: min 40 l/h
optimum 50 l/h
Temperature: 5 to 50 °C
Inlet pressure_{Abs.} (25 °C): 0.1 up to 3.0 bar
Outlet pressure: pressure-free
Particle size: < 100 µm

Ambient Conditions

Temperature: 5 to 40°C
Humidity 5 to 95% rel. (without condensation)

Sample connections

Sample inlet: 1/4" BSP F
Sample inlet with tangential filtration D 12 pipe
Sample outlet: soft tubing D INT 9
Sample outlet (fast loop): soft tubing D INT 18
Sample outlet waste: soft tubing D INT 12
Sample outlet (Multi-channel): soft tubing D INT 19

Wall cabinet

Dimensions: 993 x 600 x 422 mm
Material: Stainless Steel 316
Total weight: 80 kg
Protection degree: IP 55

Reagent specifications

Type	Code
Sodium Peroxodisulfate 250g/l	R0x208G250
Reagent Consumption:	
Low-Mid Range	1.5 l/month
High Range	3l/month
Sulfuric Acid 2N (H ₂ SO ₄ 2N)	R0x159
Reagent Consumption	1.5l/month