



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

EZ-TOC II analyzer CA52TOC

Analyzer for continuous real-time TOC measurement in water and wastewater



Application

- Monitoring of organic carbon in water and wastewater
- Industrial processes
- Monitoring of sewage treatment plant outlet
- Monitoring of source and drinking water
- Control of methanol dosage

Your benefits

- Measurements down to 50 ppb
- Correlation to COD is possible
- Measurement of grab samples is possible
- Two-channel-version available
- Effective self monitoring - follows ISO and EPA approved methods

Function and system design

Measuring principle

Liquid circuit

The sample is drawn by a fast-loop system with a coarse, self-cleaning filter. A small quantity is drawn off and phosphoric or nitric acid is added before sent through a scrubber. Inorganic carbon is now eliminated as CO_2 . The stripping process also eliminates any volatile substances. The sample is then combined with sodium persulphate and transferred to the reactor, where the organic substances in solution are further oxidized with UV-irradiation at about $75\text{ }^\circ\text{C}$ ($170\text{ }^\circ\text{F}$).

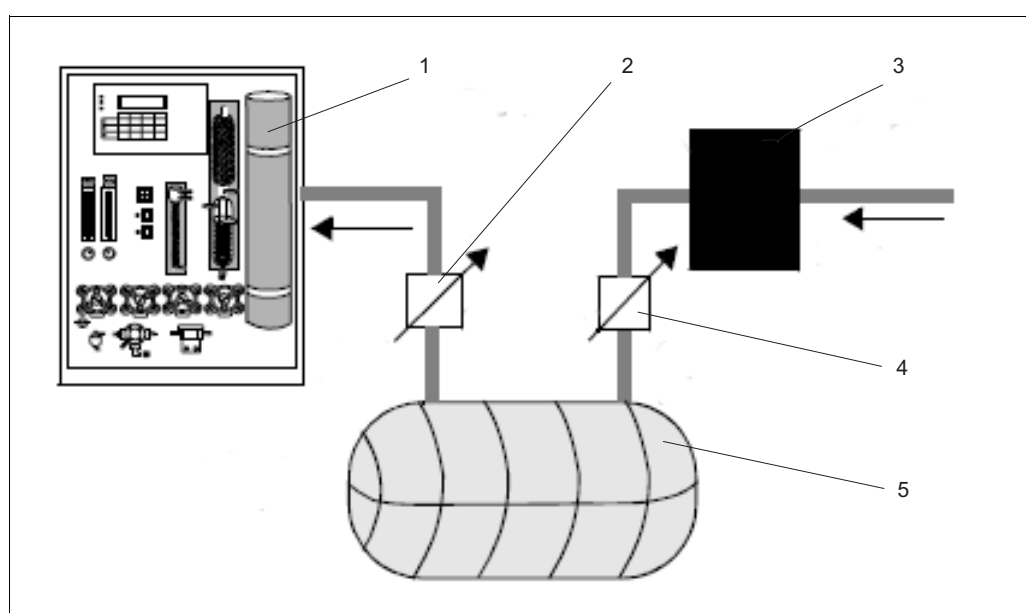
Gas circuit

The carrier gas used is CO_2 -free air, nitrogen or oxygen. The carbon dioxide generated in the reactor in the presence of moisture is pass along through a condenser for drying and then transferred to the measurement cell. The cell is flushed with carrier gas to zero the measurement and compensate for any residual CO_2 , water vapor or other contaminants.

Measurement/calibration

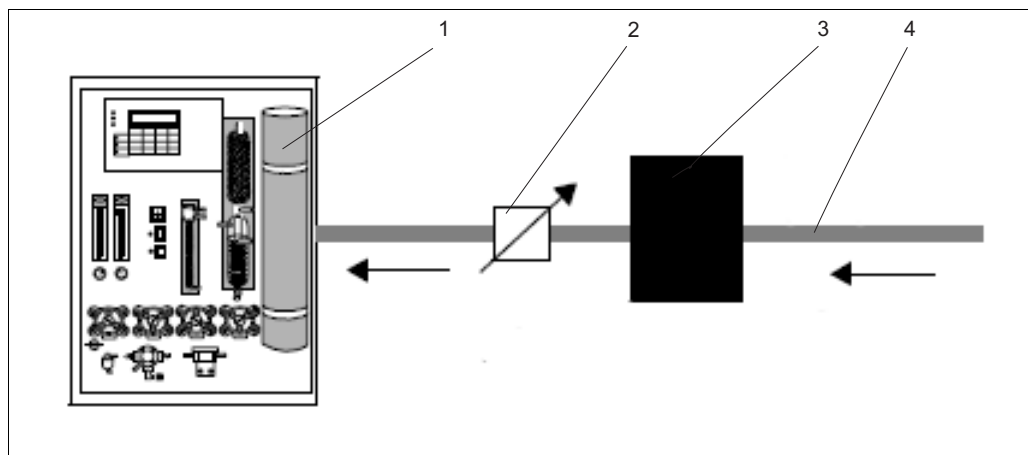
Measurement is performed by determining non-dispersive infra red absorption (NDIR) of the produced CO_2 -gas. The calibration functions may be programmed at two points with a reference liquid or gas and a self-cleaning function.

Measuring system



Measuring system when air supply is unstable

- 1 EZ-TOC II analyzer CA52TOC
- 2 Pressure regulator
- 3 CO_2 scrubber
- 4 Pressure regulator
- 5 Air reservoir $> 5\text{ l}$ ($> 1.3\text{ US gal}$)



Measuring system when air supply is stable

- 1 EZ-TOC II analyzer CA52TOC
 2 Pressure regulator
 3 CO₂ scrubber
 4 Stable air supply (or bottle) > 6 bar (> 87 psi)

Input

Measured variables

TOC or TC

Measuring range

Version	Measuring range
A	0.015 to 10 mg TOC / l
B	0.1 to 100 mg TOC / l
C	0.5 to 500 mg TOC / l
D	10 to 1000 mg TOC / l
E	50 to 5000 mg TOC / l
F	100 to 10000 mg TOC / l

Output

Current range

0/4 to 20 mA

Interface

RS 232 - unidirectional

Alarm

Two programmable alarm levels per channel with up to 8 programmable type C relays
 Type C relay: SPDT switch, isolated contacts; each contact is rated at 0.5 A @ 24 V DC / 230 V AC.
 Relay board with 4 relays is part of the system.

Programmable outputs

Up to 8 customer-programmable outputs on type C relays. Can be programmed to output any combination of multiple system parameters (including the four alarms).

Display

4-line, 20 characters per line, backlit liquid crystal display (LCD)

Power supply

Electrical connection	115 V AC $\pm 10\%$, 50/60 Hz, 2 Amperes, 230 VA 230 V AC $\pm 10\%$, 50/60 Hz, 1 Ampere, 230 VA The unit should have its own dedicated, unswitched circuit.
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Fuses	Supply voltage	Fuses
	230 V AC	2 x microfuse 1.25 A, 250 V, slow-blow
	115 V AC	1 x microfuse 3.0 A, 250 V, slow-blow

Performance characteristic

Accuracy	$\pm 1.5\%$ for TOC concentrations ranging from 0 to 75 % of full scale $\pm 2.5\%$ for TOC concentrations ranging from 75 to 100 % of full scale
Response time	Less than 8 minutes to t_{90} at 100 mg/l configuration TOC
Repeatability	$\pm 1\%$ of full scale.
Drift	$\pm 1\%$ of full scale over 72 hours without calibration at 20 °C (68 °F).
Temperature stability	Less than 2% of full-scale drift over ambient range of 10 to 30 °C (50 to 86 °F).
Inorganic carbon removal	$\geq 95\%$, when using standard TIC scrubber. $\geq 98\%$, when using ultra TIC scrubber.

Installation conditions

Compressed air	The compressed air (used as a carrier gas) must be dry and must meet the following specifications: <ul style="list-style-type: none"> ■ < 3 ppm CO_2 ■ < 3 ppm hydrocarbon ■ Constant pressure 2 bar (29 psi). ■ Consumption 500 to 750 cm^3/min ■ The in-house compressed air supply must be equipped with a CO_2 scrubber (input pressure 4.0 to 10 bar (58 to 145 psi)) and a pressure reducing valve. Bottled air, nitrogen or oxygen can also be used as a carrier gas.
Exhaust	Inside of buildings an exhaust is required. No accumulation of halogens or other vapors is allowed in this area.
Drain	Gravity drain, vented to atmosphere. Use a drain pipe made out of plastic or rubber.

Environment

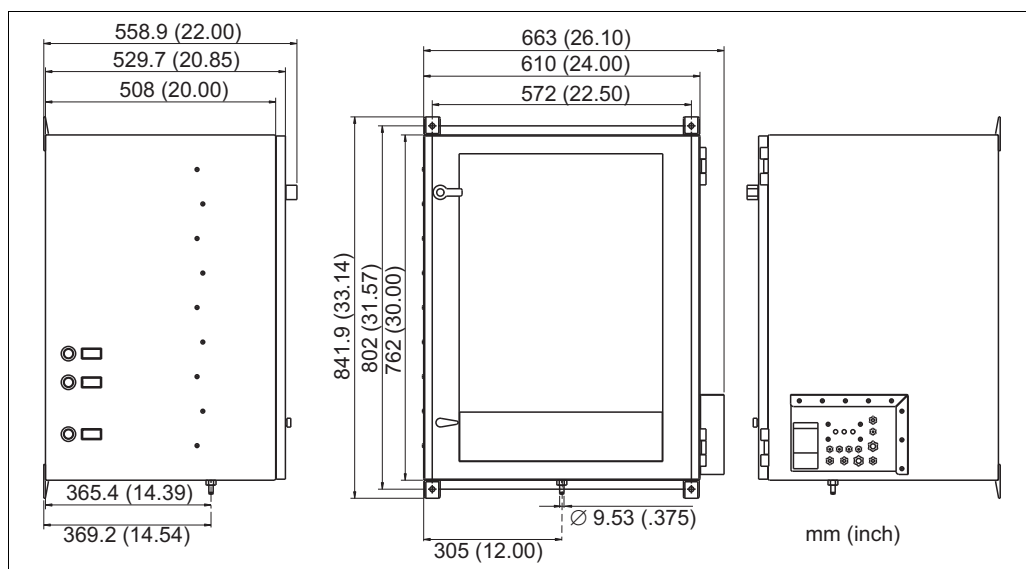
Ambient temperature	> 0 to 40 °C (> 32 to 104 °F)
Humidity	max. 90 %
Ingress protection	IP 54
Storage conditions	Store in dry rooms only. Use appropriate packaging to store.

Process

Medium inlet pressure	Unpressurized; low overpressure of max 0.2 bar (2.9 psi) is permissible.
Medium outlet pressure	Unpressurized exhaust
Suspended solids	For particle sizes $\geq 200 \mu\text{m}$, an appropriate sample preparation (e.g. PA-2 or PA-3) is required. 3 % maximum concentration of suspended solids by volume.
Flow volume	Max. 50 ml/min at 60 Hz
Reagents	1.5 M $\text{Na}_2\text{S}_2\text{O}_8$ (sodium persulfate), 10% (v/v) H_3PO_4 (phosphoric acid) or 5% HNO_3 (nitric acid), each in deionized water. Consumption: 19.7 l (5.2 US gal) / month each

Mechanical construction

Dimensions



Dimensions

Weight approx. 73 kg (160 lbs)

Housing IP 54

Certificates and approvals

CE symbol

Declaration of conformity

The product meets the requirements of the harmonized European standards. It thus complies with the legal requirements of the EC directives.

The manufacturer confirms successful testing of the product by affixing the CE symbol.

Ordering information

Product structure

Measuring range	
A	0.015 to 10 mg/1 TOC
B	0.1 to 100 mg/1 TOC (not with CA52TOC-**C****)
C	0.5 to 500 mg/1 TOC (not with CA52TOC-**C****)
D	10 to 1000 mg/1 TOC (not with CA52TOC-**C****)
E	50 to 5000 mg/1 TOC (not with CA52TOC-**C****)
F	100 to 10000 mg/1 TOC (not with CA52TOC-**C****)
Y	Special version according to customer specification
Sample transfer	
1	1 measuring point (not with CA52TOC-****D**; CA52TOC-****E**)
2	2 measuring points
TIC removal	
A	Standard
B	High
C	Ultra high (only with CA52TOC-A*****)
Y	Special version according to customer specification
Power supply	
0	230 VAC, 50/60 Hz
1	115 VAC, 50/60 Hz
Sample preparation	
A	Not selected
B	1 x PA-2 PVC, 1 to 8 m ³ /h (4.4 to 35 gpm) wastewater
C	1 x PA-3 PVC, 0.1 to 1.0 m ³ /h (0.4 to 4.4 gpm) wastewater
D	2 x PA-2 PVC, 1 to 8 m ³ /h (4.4 to 35 gpm) wastewater (not with CA52TOC-*1****)
E	2 x PA-3 PVC, 0.1 to 1.0 m ³ /h (0.4 to 4.4 gpm) wastewater (not with CA52TOC-*1****)
Y	Special version according to customer specification
Carrier gas	
0	To order separately
1	CO ₂ scrubber
2	CO ₂ scrubber + compressor
9	Special version according to customer specification
Output	
A	0/4 to 20 mA + RS 232 unidirectional
CA52TOC-	Complete order code

Sample processor

For detailed information please see:

Sample processor	Documentation number
PA-2	20807601EB
PA-3	20807605EB

Accessories

Maintenance kits

- 90 / 180 day maintenance kit
 - Includes the tubing for all pump head sizes
 - Order number: 71092036
- Set of service parts for annual maintenance PA-2
 - Order number: 71013847
- Set of service parts for annual maintenance PA-3
 - Order number: 71013848
- PA-2 piping without solenoids
 - Order number: 71093894
- PA-3 piping without solenoids
 - Order number: 71093895
- Solenoids for PA-2/PA-3, 115V AC
 - Order number: 71093896
- Solenoids for PA-2/PA-3, 230V AC
 - Order number: 71093897
- Carrier gas generator
 - Order number 115 V AC: 71092115
 - Order number 230 V AC: 71092116

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