

# Real-Time Measurement of Total Carbon



## Total Carbon Analyzer Model TCA08

### KEY FEATURES

- Continuous analysis of Total Carbon content of aerosol
- Combine with Aethalometer® to derive OC/EC
- Sampling time 20 min to 24 hours
- Uses ambient air as carrier gas
- Rugged, All-Steel Construction
- Easy installation, operation and maintenance

### APPLICATIONS

- Air Quality monitoring
- Health Effects, Climate Change research
- Emissions testing



Developed and manufactured in  
Europe by Aerosol d.o.o., Slovenia

# Product specifications

## MEASUREMENT PRINCIPLE

Two identical flow channels for sampling and analysis. Sample is collected on 47-mm quartz fiber filter in stainless-steel combustion chamber. At end of sampling timebase, collection flow is switched to second channel while first channel is analyzed. Collected sample is flash-heated to convert all Carbon to CO<sub>2</sub>. Ambient air is used as “analytical” carrier gas at low flow rate. The baseline level of CO<sub>2</sub> in ambient air is determined before and after the heating cycle. Large pulse of CO<sub>2</sub> in analytical flow is integrated over ambient baseline to determine Total Carbon content of sample.

## “NO GLASS, NO GAS”

**No glass.** Chambers constructed entirely from stainless steel. Rugged FeCrAl alloy heating elements.

**No gas.** Uses ambient air as carrier: does not need any specialty gas supplies.

**No catalyst.**

## DETERMINATION OF OC AND EC

BC data from Aethalometer AE33 is used to derive EC. OC is obtained by simple subtraction: OC = TC – EC.

The relationship between BC and EC depends on aerosol composition and the thermal protocol used for ‘EC’ assignment.

## COMBINATION WITH AE33 AETHALOMETER

Cable connection: TCA software receives Aethalometer data.

## SAMPLING

Standard flow rate of 16.7 SLPM (1 m<sup>3</sup>/h), provided by closed-loop stabilized internal pump. Standard PM2.5 inlet is included. Sampled air stream must be non-condensing (RH < 90% at instrument temperature).

Opening altitude 0 ~ 3000 m.

Ambient meteorological sensor (P, T, RH) is included to control sampling flow to ambient volumetric conditions.

## TIME RESOLUTION

Timebase for sampling and analysis is adjustable from 20 minutes to 24 hours. Default setting is 1 hour.

## ANALYTICAL PERFORMANCE

Limit of Detection: 300 ng C/m<sup>3</sup> (1-h timebase, 16.7 LPM flow)

Range: 300 ng/m<sup>3</sup> to 300.000 ng/m<sup>3</sup> of Total Carbon

## OPERATOR INTERFACE

21-cm color touch-screen with status indicator LED's.

## REMOTE MANAGEMENT

Network ready for remote management and data transfer.

## QUICK-CHANGE ANALYTICAL CHAMBER

Modular for easy servicing, routine replacement of quartz sampling filter, or exchange of heating elements.

## PHYSICAL SPECIFICATIONS

- Constructed in standard 19-inch rack-mount chassis.
- Dimensions (HxWxD): 42 x 48 x 60 cm (17" x 19" x 24")  
Height required for inlet assembly: 120 cm (4 feet)
- Weight: 35 kg (78 lbs.)
- Electrical supply: 100~240 VAC, 50/60 Hz
- Power consumption (maximum): 100 W sampling, 600 W analysis (typical 1-minute duration).
- Internal sampling pump: dual diaphragm, brushless speed-controlled DC motor, stabilized flow.
- Modular internal hardware for rapid servicing.
- Constructed in fully-enclosed, self-contained rack-mount chassis.

## INSTALLATION REQUIREMENTS

Indoor or laboratory use, rack or benchtop.

Ambient environment 10°C ~ 35°C, non-condensing.

## ACCESSORIES

PM2.5 inlet (PN 4117)

Shockproof and waterproof transit case (PN TCA08 4 02 001)

Air flow calibrator (BGI TetraCal) (PN7950)

Tube coupling fixed (PN TCA08 8 03 003)

Tube coupling (PN TCA08 8 03 004)

Sample line system (consists of tubes of different lengths, curvatures, 14/18mm diameter) (PN TCA08 8 22 000)

Filter Cartridge (for Clean Air performance test) (PN8072)

## CONSUMABLE & OPERATIONAL SUPPLIES

47-mm. quartz fiber filters, package of 25 (PN TCA08 5 01 006)

Cartridge filter (PN 8072)

Capsule filter (PN TCA08 9 03 002)

## EXCHANGE SERVICE COMPONENTS

VOC Denuder Cartridge (PN TCA08 5 01 004)

Analytical Chamber Assembly (PN TCA08 8 01 000)

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