



World Calibration Centre  
for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



Leibniz Institute for  
Tropospheric Research

**CPC Model:** TSI CPC 3010

**CPC Serial Number:** 70419349

**Customer:** TROPOS

**Description:** Calibration of a Condensation Particle Counter (CPC, Model 3772)

**Date of Calibration:** September 16, 2020

**Summary of Intercomparison:**

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 100% efficiency at 40 nm. The Dp50 is at 10.84 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: September 16, 2020      Signature:

Reviewed by: **TROPOS**

Name: **Kay Weinhold**

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**Date of arrival of instrument in calibration lab:**

*September 15, 2020*

**Instrument:**

*Condensation Particle Counter*

**Model and serial number of instrument:**

*CPC 3010 S/N 70419349*

**Result of physical inspection:**

*no damages*

**Result of functional test:**

*functional test successful, no problems*

**Internal parameters of instrument**

*nominal flow rate 1.0 l/min*

**Model and identification number of  
aerosol electrometer:**

*TSI Electrometer Model 3068, S/N 70838596*

**Electrometer calibration certificate:**

*September 5, 2018, calibrated at PTB  
Braunschweig*

**Corrections of electrometer, for instance,  
differing flow rate:**

*Within tolerance range (+/-2%); reference: 4.0  
l/min, measured: 4.000 l/min*

**Software for recording:**

*LabView 2010; National Instruments; Program  
„LabCount.vi“*

**Date of calibration:**

*September 16, 2020*

**Lab temperature and pressure:**

*23.0°C, 100.1 mbar*

**Measured aerosol flow rate of CPC:**

*1.000 l/min*

**Uncertainty in measured flow rate:**

*3%*

**Flowmeter used:**

*Gilian Gilibrator V; S/N 1711008-S,  
January, 2018*

**Particles and gases used for calibration:**

*silver particles and nitrogen*

**Method of particle generation:**

*tube furnace generator*

**Zero measurement of instrument:**

*0 particles/cm<sup>3</sup> in 5 minutes*

**Results (using pulse output):**

| Particle size (nm)          | 40   | 30   | 20   | 15   | 14   |
|-----------------------------|------|------|------|------|------|
| Number concentration (cm-3) | 1336 | 1411 | 1784 | 963  | 1234 |
| Counting efficiency $\eta$  | 1.02 | 1.03 | 1.00 | 0.87 | 0.81 |
| Particle size (nm)          | 11   | 10   | 09   | 08   | 07   |
| Number concentration (cm-3) | 481  | 653  | 394  | 105  | 39   |
| Counting efficiency $\eta$  | 0.52 | 0.37 | 0.22 | 0.09 | 0.02 |
| Particle size (nm)          | 06   | 05   | 40   |      |      |
| Number concentration (cm-3) | 1    | 0    | 1383 |      |      |
| Counting efficiency $\eta$  | 0.00 | 0.00 | 1.02 |      |      |



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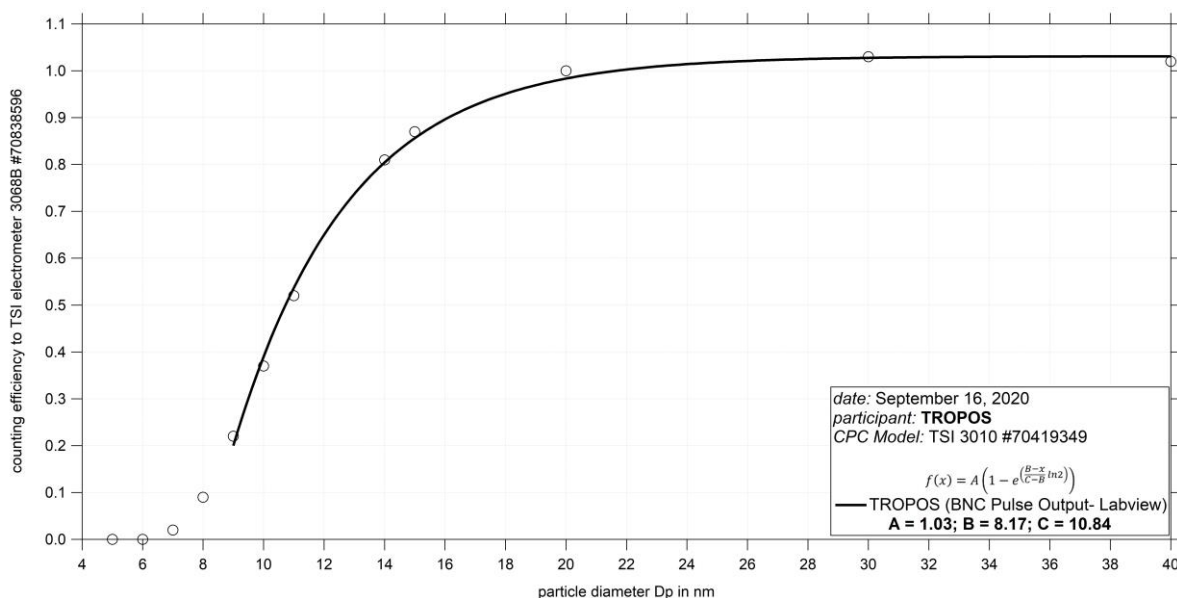


Fig. 1: Counting efficiency for TSI CPC 3010 S/N 70419349 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration.

**Status information:**

| Status       | T SAT | T CON | T OPT | T CAB | P AMB | P VAC   |
|--------------|-------|-------|-------|-------|-------|---------|
| from display | -     | -     | -     | -     | -     | -       |
| Status       | P OR  | P NO  | Laser | LV    | flow  | P INLET |
| from display | -     | -     | -     | full  | 1.000 | -       |

**Date of issue:** September 16, 2020

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold