



**World Calibration Centre  
for Aerosol Physics**

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



**Leibniz Institute for  
Tropospheric Research**

**CPC Model:** TSI CPC 3772

**CPC Serial Number:** 70835059

**Customer:** TROPOS

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

**Date of Calibration:** 08 05, 2020

**Summary of Intercomparison:**

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 99% efficiency at 40 nm. The Dp50 is at 7.81 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: May 17, 2020 Signature:

Reviewed by: **TROPOS**

Name: **Kay Weinhold**

Page 1 / 3



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

-

**Instrument:**

*Condensation Particle Counter*

**Model and serial number of instrument:**

*CPC 3772 S/N 70835059*

**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:**

*May 08, 2020*

**Lab temperature and pressure:**

*23.0°C, 999 mbar*

**Measured aerosol flow rate of CPC:**

*1.004 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   | 10   |
|-----------------------------|------|------|------|------|------|
| Number concentration (cm-3) | 995  | 1371 | 1152 | 1360 | 1342 |
| Counting efficiency $\eta$  | 0.99 | 0.99 | 0.99 | 0.95 | 0.76 |
| Particle size (nm)          | 09   | 08   | 07   | 06   | 05   |
| Number concentration (cm-3) | 1175 | 617  | 362  | 69   | 0    |
| Counting efficiency $\eta$  | 0.67 | 0.53 | 0.32 | 0.00 | 0.00 |



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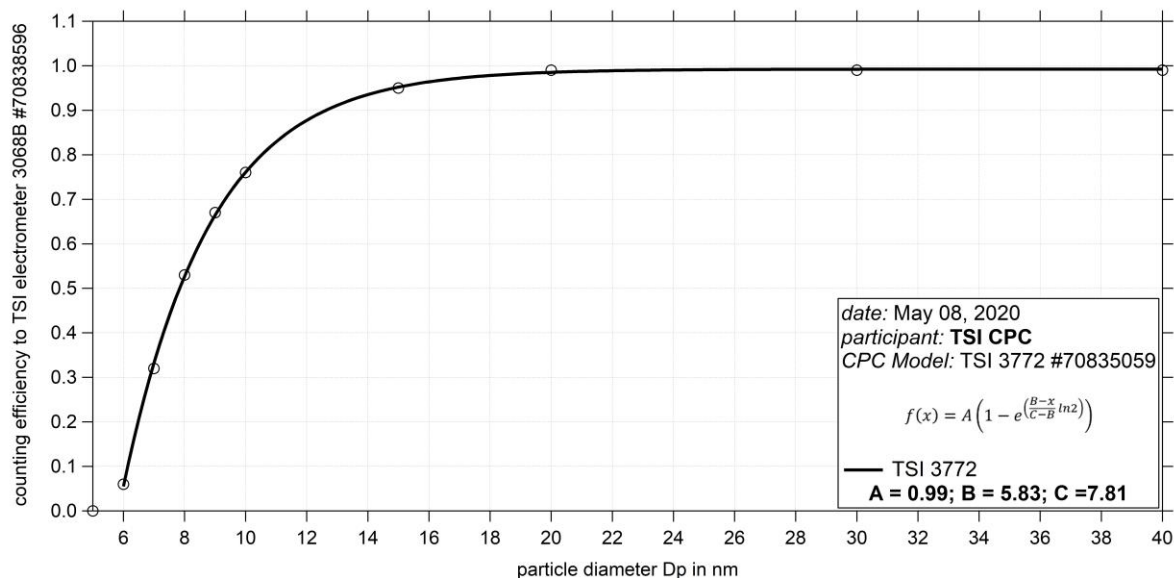


Fig. 1: Counting efficiency for CPC 3772S/N 70835059 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated  $D_{p50}$  is 7.81 nm.

#### Status information:

| Status       | <i>T SAT</i> | <i>T CON</i> | <i>T OPT</i> | <i>T CAB</i> | <i>P AMB</i> | <i>P VAC</i>   |
|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| from display | 39.1         | 22           | 40.0         | 31.2         | 100.4        | -              |
| Status       | <i>P OR</i>  | <i>P NO</i>  | <i>Laser</i> | <i>LV</i>    | <i>flow</i>  | <i>P INLET</i> |
| from display | 85.0         | 2.7          | 47           | full         | 1.004        | -              |

Date of issue: May 18, 2020

Reference: TSI electrometer, model 3068, SN 70838596

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Page 3 / 3