World Calibration Centre
for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

TROPOS
Leibniz Institute for
Tropospheric Research

**CPC Model**: TSI CPC 3010

**CPC Serial Number**: 2117 (TCPC Haenger)

**Customer**: -

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

**Date of Calibration:** June 15, 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 10.22 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: June 15, 2020 Signature:

Reviewed by: **TROPOS** Name: **Kay Weinhold**



Leibniz-Institut für Troposphärenforschung e.V.
Telefon: +49 341 2717-7060
Telefax: +49 341 2717-99-7060
info@tropos.de
http://www.tropos.de

Commerzbank Leipzig
KTO 102 14 50
BLZ 860 400 00
IBAN: DE77 8604 0000 0102 1450 00
SWIFT CODE: COBADEFF 860

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| | |
|---|---|
| **Date of arrival of instrument in calibration lab:** | *February 11, 2020* |
| **Instrument:** | *Condensation Particle Counter* |
| **Model and serial number of instrument:** | *CPC 3010 S/N 2117* |
| **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:** | *June 15, 2020* |
| **Lab temperature and pressure:** | *23.0°C, 993.0 mbar* |
| **Measured aerosol flow rate of CPC:** | *1.009 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/cm³ in 5 minutes* |

**Results (using pulse output): After calibrating**

| **Particle size (nm)** | ***40*** | ***30*** | ***20*** | ***15*** | ***10*** |
|---|---|---|---|---|---|
| **Number concentration (cm-3)** | 1182 | 1589 | 1471 | 1148 | 946 |
| **Counting efficiency η** | *1.02* | *1.01* | *1.02* | *0.93* | *0.44* |
| **Particle size (nm)** | ***09*** | ***08*** | ***07*** | ***40*** | |
| **Number concentration (cm-3)** | 546 | 203 | 56 | 1253 | |
| **Counting efficiency η** | *0.30* | *0.14* | *0.03* | *1.00* | |



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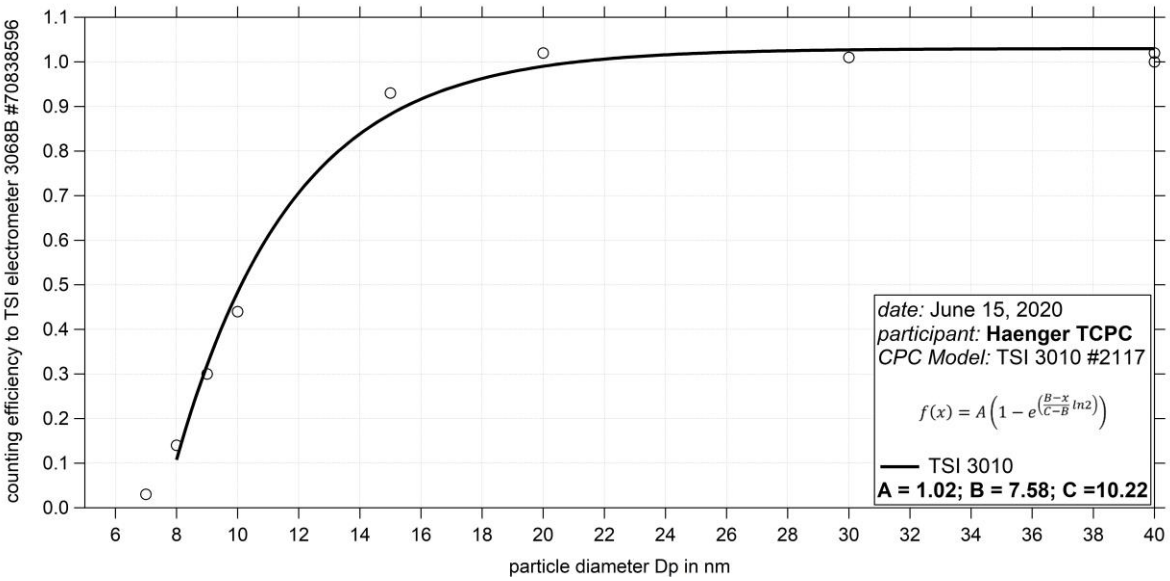


*Fig. 1: Counting efficiency for CPC 3010 S/N 2117 against aerosol electrometer 3068 S/N 70838596; silver particles between 7 and 40 nm were used for calibration; Dp50 is 10.22*

**Date of issue:** *June 15, 2020*

Reference: TSI electrometer, model 3068, SN *70838596*
Reviewed: TROPOS / Kay Weinhold



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