



World Calibration Centre  
for Aerosol Physics



Leibniz Institute for  
Tropospheric Research

## Intercomparison of Condensation Particle Counter

**Project No.:** CPC-2020-1-7

**CPC Model:** TSI CPC 3772 (Reference Instrument)

**CPC Serial Number:** 71011008

**Principal Investigator:** Kay Weinhold

**Home Institution:** TROPOS

**Participant:** -

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

**Date of Calibration:** March 18, 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 7.07 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: March 20, 2020

Signature:

Reviewed by: **TROPOS**

Name: **Kay Weinhold**



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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 71011008*

**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:** *March 18, 2020*  
**Lab temperature and pressure:** *23.0°C, 1008 mbar*  
**Measured aerosol flow rate of CPC:** *1.006 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 and logging via TROPOS LabVIEW software):**

Particle size (nm)	40	30	20	15	10	09
Number concentration (cm-3)	1336	1509	1002	1192	1521	1438
Counting efficiency $\eta$	0.99	1.01	1.00	0.99	0.83	0.76
Particle size (nm)	08	07	06	05	40	
Number concentration (cm-3)	1191	1058	458	45	1085	
Counting efficiency $\eta$	0.64	0.48	0.27	0.03	0.99	



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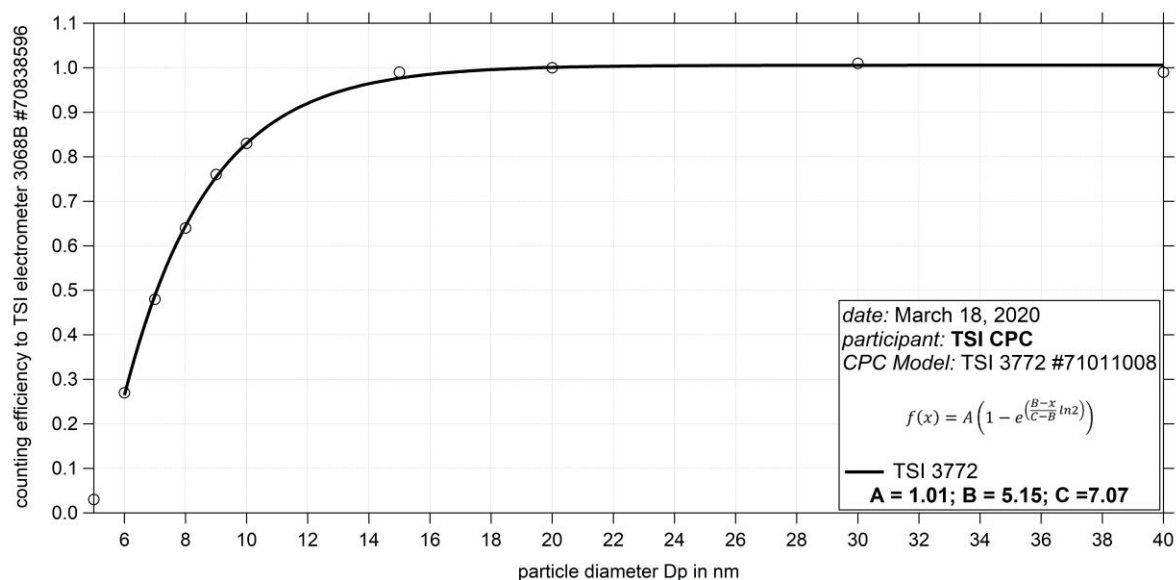


Fig. 1: Counting efficiency for CPC 3772 S/N 7101008 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated Dp50 is 7.07 nm.

**Status information:**

Status	T SAT	T CON	T OPT	T CAB	P AMB	P VAC
from display	39.0	22	40.0	30.9	101.5	-
Status	P OR	P NO	Laser	LV	flow	P INLET
from display	76.2	2.6	55	full	1.006	-

**Date of issue:** March 20, 2019

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold

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