



World Calibration Centre
for Aerosol Physics



Leibniz Institute for
Tropospheric Research

Intercomparison of Condensation Particle Counter

Project No.: CPC-2020-1-4

CPC Model: TSI CPC 3776

CPC Serial Number: 70820072

Principal Investigator: Dr. Paul Williams

Home Institution: Manchester University, UK

Participant: -

Description: Calibration of a Condensation Particle Counter (CPC, Model 3776)

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 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: *March 16, 2020*
Instrument: *Condensation Particle Counter*
Model and serial number of instrument: *CPC 3776 S/N 70820072*

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: *0.3 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 and logging via TROPOS LabVIEW software):

Particle size (nm)	40	30	20	15	10	09
Number concentration (cm-3)	1334	1487	966	1139	1618	1644
Counting efficiency η	0.99	0.99	0.97	0.94	0.89	0.86
Particle size (nm)	08	07	06	05	40	
Number concentration (cm-3)	1576	1823	1361	1238	1089	
Counting efficiency η	0.84	0.82	0.80	0.78	1.00	



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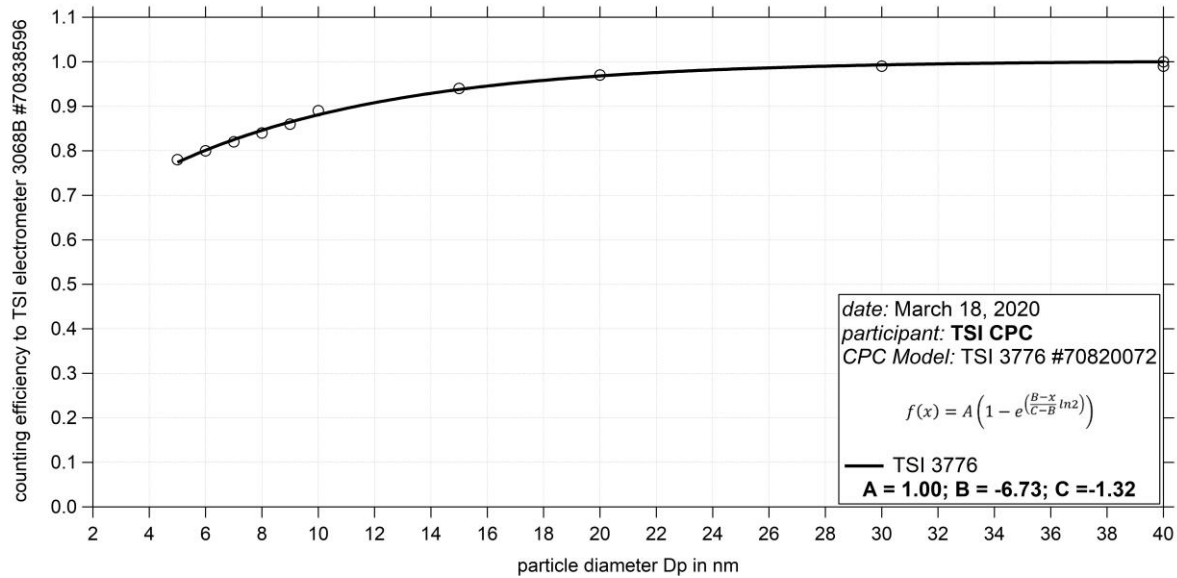


Fig. 1: Counting efficiency for CPC 3776S/N 70820072 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated Dp50 is - 1.32 nm.

Status information:

Status	T SAT	T CON	T OPT	T CAB	P AMB	P VAC
from display	39.0	10	40.0	32.7	101.4	-
Status	P OR	P NO	Laser	LV	flow	P INLET
from display	50.0	3.7	29	full	0.3	-

Date of issue: March 20, 2020

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold

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