



**World Calibration Centre
for Aerosol Physics**

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



**Leibniz Institute for
Tropospheric Research**

CPC Model: TSI CPC 3750

CPC Serial Number: 3750193301

Customer: TSI Instruments Ltd.

Description: Calibration of a Condensation Particle Counter (CPC, Model 3750)

Date of Calibration: December 02, 2019

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 6.01 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: December 02, 2019 Signature:

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

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Date of arrival of instrument in calibration lab:

November 26, 2019

Instrument:

Condensation Particle Counter

Model and serial number of instrument:

CPC 3750 S/N 3750193301

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:

December 02, 2019

Lab temperature and pressure:

23.0°C, 999.7 mbar

Measured aerosol flow rate of CPC:

0.990 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):

Particle size (nm)	40	30	20	15	10
Number concentration (cm-3)	1081	1102	1566	1475	1970
Counting efficiency η	1.00	1.02	1.02	1.00	0.92
Particle size (nm)	08	07	06		
Number concentration (cm-3)	1232	1404	1525		
Counting efficiency η	0.80	0.68	0.51		



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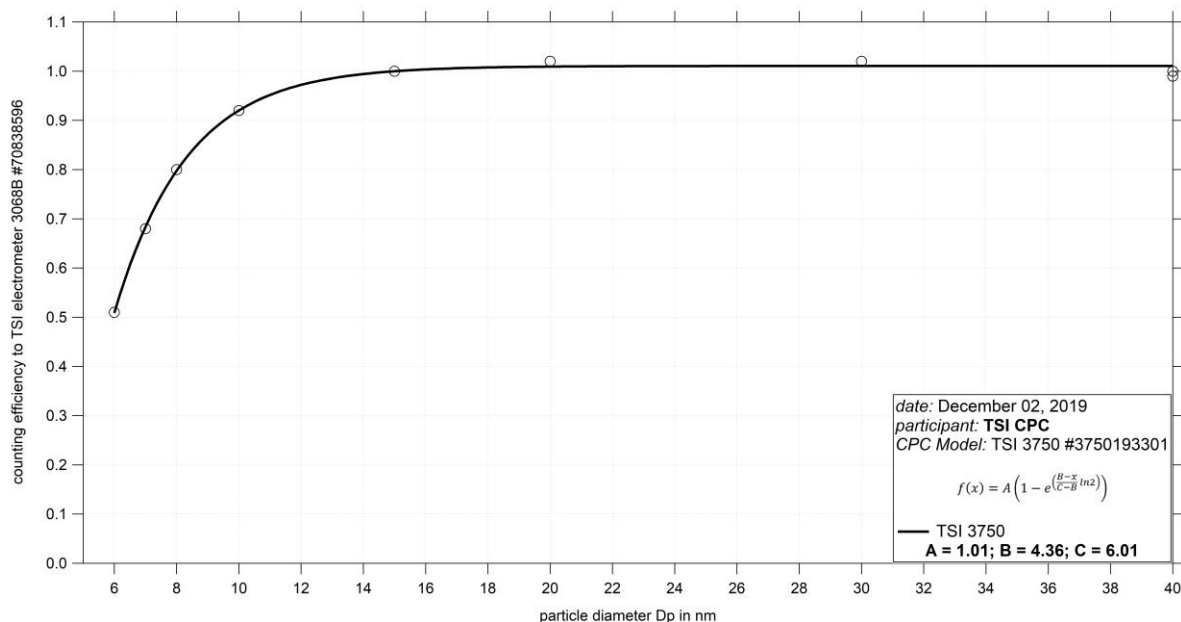


Fig. 1: Counting efficiency for CPC 3750 S/N 3750193301 against aerosol electrometer 3068 S/N 70838596; silver particles between 6 and 40 nm were used for calibration; the calculated Dp50 is 6.01 nm.

Status information:

Status	T SAT	T CON	T OPT	T CAB	P AMB	P VAC
from display	39.0	18.0	40.0	23.5	100.7	74.9
Status	P OR	P NO	Laser	LV	flow	P INLET
from display	74.2	2.34	42	full	0.990	-0.1

Results (using pulse output):

without coincidence correction					
Concentration EM in #/cm ³	64622	50236	37577	26792	15004
Number concentration without coincidence correction (cm-3)	51271	41591	32245	23813	13926
Counting efficiency η	0.79	0.83	0.86	0.89	0.93
Concentration EM in #/cm ³	7620	2493			
Number concentration without coincidence correction (cm-3)	7317	2455			
Counting efficiency η	0.96	0.98			



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with coincidence correction					
Concentration EM in $\#/cm^3$	64622	50236	37577	26792	15004
Number concentration with coincidence correction (cm^{-3})	66631	51262	37863	26836	15125
Counting efficiency η	1.03	1.02	1.01	1.00	1.01
Concentration EM in $\#/cm^3$	7620	2493			
Number concentration with coincidence correction (cm^{-3})	7740	2550			
Counting efficiency η	1.02	1.02			

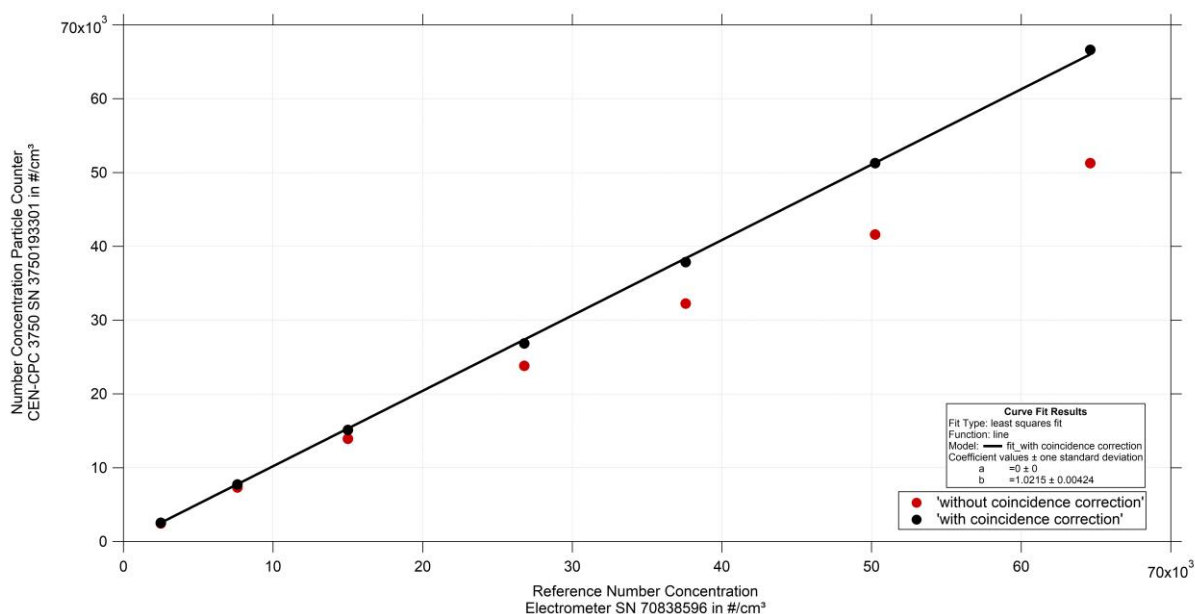


Fig. 2: Linearity test for TSI CPC 3750 SN 3750193301 against aerosol electrometer 3068 SN 70838596; silver particles with a diameter of 30 nm were used for number concentrations between 1000 and 70000 particles per cm^3 .

Date of issue: December 02, 2019

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold

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