



Leibniz Institute for Tropospheric Research

World Calibration Centre for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

CPC Model:	TSI CPC 3750			
CBC Social Number	2750102905			
CPC Serial Number:	3750193805			

Customer: TSI Instruments Ltd.

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

Date of Calibration: November 13, 2019

Summary of Intercomparison:

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 97% efficiency at 40 nm. The Dp50 is at 6.85 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: November 13, 2019 Signature:

Reviewed by: TROPOS

Name: Kay Weinhold

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Date of arrival of instrument in calibration lab: Instrument: Model and serial number of instrument:

Result of physical inspection: Result of functional test:

Internal parameters of instrument

Model and identification number of aerosol electrometer:

Electrometer calibration certificate:

Corrections of electrometer, for instance, differing flow rate:

Software for recording:

Date of calibration: Lab temperature and pressure: Measured aerosol flow rate of CPC: Uncertainty in measured flow rate: Flowmeter used:

Particles and gases used for calibration: Method of particle generation: Zero measurement of instrument:

Results (using pulse output):

November 11, 2019 Condensation Particle Counter CPC 3750 S/N 3750193805

no damages functional test successful, no problems

nominal flow rate 1.0 l/min

TSI Electrometer Model 3068, S/N 70838596

September 5, 2018, calibrated at PTB Braunschweig

Within tolerance range (+/-2%); reference: 4.0 l/min, measured: 4.000 l/min LabView 2010; National Instruments; Program "LabCount.vi"

November 13, 2019 24.5°C, 982.5 mbar 1.009 l/min 3% Gilian Gilibrator V; S/N 1711008-S, January, 2018 silver particles and nitrogen tube furnace generator 0 particles/cm³ in 5 minutes

Results (using pulse output).						
Particle size (nm)	40	30	20	15	10	
Number concentration (cm-3)	1260	1245	1463	1218	1194	
Counting efficiency η	0.97	0.97	0.97	0.96	0.83	
Particle size (nm)	09	08	07	06		
Number concentration (cm-3)	1253	784	715	440		
Counting efficiency n	0.75	0.65	0.50	0.32		

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Fig. 1: Counting efficiency for CPC 3750 S/N 3750193805 against aerosol electrometer 3068 S/N 70838596; silver particles between 6 and 40 nm were used for calibration; the calculated Dp50 is 6.85 nm.

Status information:

Status	T SAT	T CON	Τ ΟΡΤ	T CAB	P AMB	P VAC
from display	39.0	18.0	40.0	24.2	99.0	78.9
Status	P OR	P NO	Laser	LV	flow	P INLET
from display	76.0	2.49	37	full	1.009	-0.4

Results (using pulse output):

without coincidence correction					
Concentration EM in #/cm ³	66849	58164	50013	43197	32294
Number concentration without					
coincidence correction (cm-3)	51522	45794	40491	35633	27499
Counting efficiency η	0.77	0.78	0.80	0.82	0.85
Concentration EM in #/cm ³	19887	11244	5127	1177	
Number concentration without					
coincidence correction (cm-3)	17633	10310	4854	1132	
Counting efficiency η	0.88	0.91	0.94	0.96	

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with coincidence correction						
Concentration EM in #/cm ³	66849	58164	50013	43197	32294	
Number concentration with						
coincidence correction (cm-3)	66736	57709	49698	42728	31698	
Counting efficiency η	1.00	0.99	0.99	0.99	0.98	
Concentration EM in #/cm ³	19887	11244	5127	1177		
Number concentration with						
coincidence correction (cm-3)	19494	11122	5162	1203		
Counting efficiency η	0.98	0.99	1.00	1.02		

Fig. 2: Linearity test for TSI CPC 3750 SN 3750193805 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 cm³.

Date of issue: November 13, 2019

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

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