World Calibration Centre
for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

TROPOS
Leibniz Institute for
Tropospheric Research

CPC Model: TSI CPC 3772

CPC Serial Number: 70944032

Customer: Umweltbundesam - Neuglobsow

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

Date of Calibration: June 04, 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 9.83 nm. The candidate was calibrated to Dp50 of 10nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: June 04, 2020 Signature:

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

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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 3772 S/N 70944032*
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 04, 2020*
Lab temperature and pressure:	*23.0°C, 982.0 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): Pre-Status

Particle size (nm)	***40***	***30***	***20***	***15***	***10***
Number concentration (cm-3)	1023	1358	1151	1380	1055
Counting efficiency η	*1.00*	*0.99*	*0.98*	*0.94*	*0.73*
Particle size (nm)	***09***				
Number concentration (cm-3)	852				
Counting efficiency η	*0.61*				

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Results (using pulse output): After calibrating

Particle size (nm)	***40***	***30***	***20***	***15***	***10***
Number concentration (cm-3)	1417	1229	1665	1324	788
Counting efficiency η	*1.00*	*1.00*	*0.97*	*0.88*	*0.53*
Particle size (nm)	***09***	***08***	***07***		
Number concentration (cm-3)	568	230	20		
Counting efficiency η	*0.37*	*0.17*	*0.01*		

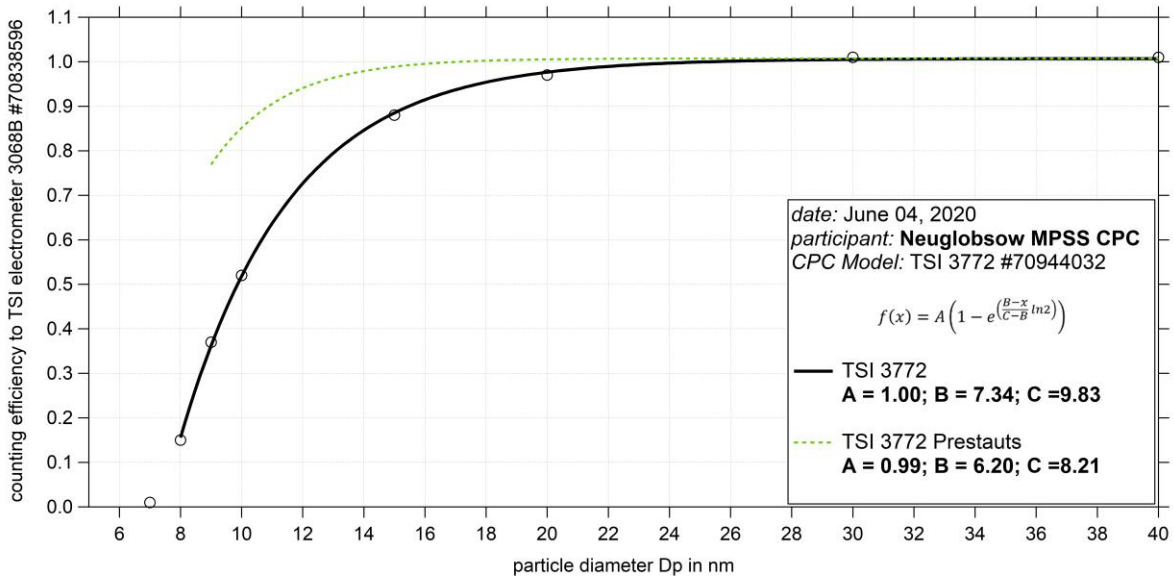

Fig. 1: Counting efficiency for CPC 3772 S/N 70944032 against aerosol electrometer 3068 S/N 70838596; silver particles between 7 and 40 nm were used for calibration; The instrument was calibrated to Dp50 of 10nm and resulted in a Dp50 of 9.83nm. The graph shows the counting efficiency before the calibration and after.

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Status information:

Status	***T SAT***	***T CON***	***T OPT***	***T CAB***	***P AMB***	***P VAC***
from display	39.0	24	40.0	27.5	97.4	-
Status	***P OR***	***P NO***	***Laser***	***LV***	***flow***	***P INLET***
from display	79.7	2.6	52	full	1.009	-

Date of issue: *June 04, 2020*

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

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