



**World Calibration Centre  
for Aerosol Physics**

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



**Leibniz Institute for  
Tropospheric Research**

**CPC Model:** TSI CPC 3772

**CPC Serial Number:** 70738095 (Total CPC)

**Customer:** Umweltbundesam - Schauinsland

**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 9.90 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**

Page 1 / 4



World Calibration Centre  
for Aerosol Physics



Leibniz Institute for  
Tropospheric Research

**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 70738095*

**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:** *1.008 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): Pre-Status**

<b>Particle size (nm)</b>	<b>40</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>
<b>Number concentration (cm-3)</b>	1040	1380	1137	1280	786
<b>Counting efficiency <math>\eta</math></b>	1.02	1.01	0.97	0.88	0.54
<b>Particle size (nm)</b>	<b>09</b>				
<b>Number concentration (cm-3)</b>	587				
<b>Counting efficiency <math>\eta</math></b>	0.42				



World Calibration Centre  
for Aerosol Physics



Leibniz Institute for  
Tropospheric Research

**Results (using pulse output): After calibrating**

Particle size (nm)	<b>40</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>
Number concentration (cm-3)	1437	1248	1674	1304	781
Counting efficiency $\eta$	1.01	1.02	0.97	0.87	0.53
Particle size (nm)	<b>09</b>	<b>08</b>	<b>07</b>		
Number concentration (cm-3)	569	276	32		
Counting efficiency $\eta$	0.37	0.20	0.02		

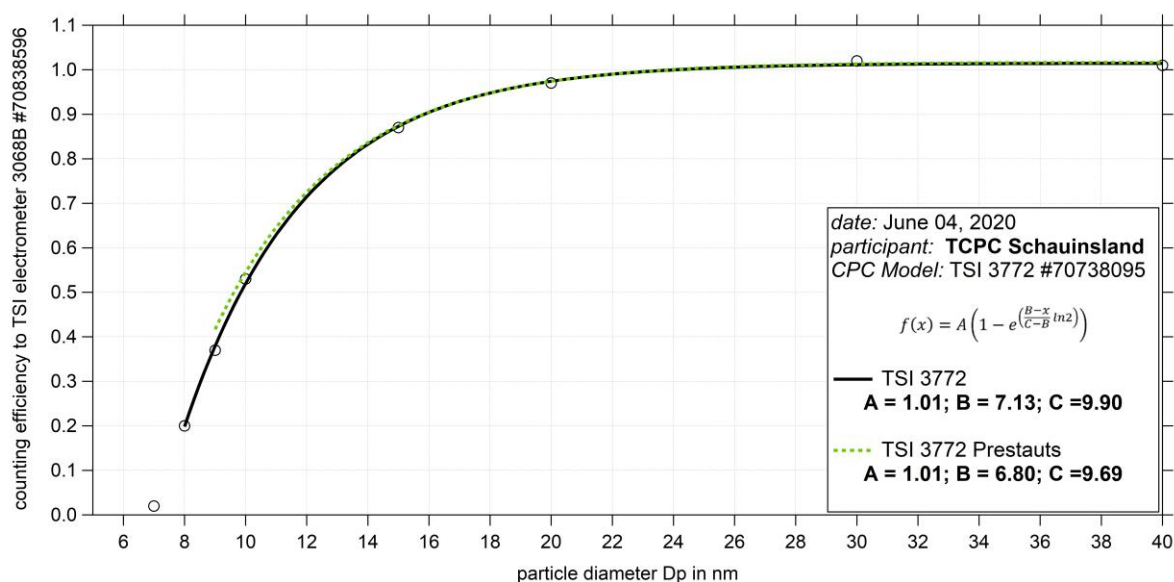


Fig. 1: Counting efficiency for CPC 3772 S/N 70738095 against aerosol electrometer 3068 S/N 70838596; silver particles between 7 and 40 nm were used for calibration; The instrument was calibrated to Dp50 of 10nm and resulted in a Dp50 of 9.90nm. The graph shows the counting efficiency before the calibration and after.



World Calibration Centre  
for Aerosol Physics



Leibniz Institute for  
Tropospheric Research

**Status information:**

<b>Status</b>	<b>T SAT</b>	<b>T CON</b>	<b>T OPT</b>	<b>T CAB</b>	<b>P AMB</b>	<b>P VAC</b>
from display	39.0	25.2	40	28.7	98.4	-
<b>Status</b>	<b>P OR</b>	<b>P NO</b>	<b>Laser</b>	<b>LV</b>	<b>flow</b>	<b>P INLET</b>
from display	74.6	2.7	39	full	1.008	-

**Date of issue:** June 04, 2020

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold

Page 4 / 4