



**World Calibration Centre  
for Aerosol Physics**

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



**Leibniz Institute for  
Tropospheric Research**

**CPC Model:** TSI UCPC 3022

**CPC Serial Number:** 455

**Customer:** Prof. Anne Kasper-Giebl  
Leitung Sonnblick Observatorium / Head of the Sonnblick Observatory  
ZAMG - Zentralanstalt für Meteorologie und Geodynamik  
A-5020 Salzburg, Freisaalweg 16, AUSTRIA

**Description:** **Calibration of a Condensation Particle Counter (UCPC, Model 3022)**

**Date of Calibration:** January 24, 2020

Certificate / Reference: WCCAP

Date of issue: January 24, 2020

Signature:

Reviewed by: **TROPOS**

Name: **Kay Weinhold**

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**Date of arrival of instrument in calibration lab:** *January 24, 2020*  
**Instrument:** *Condensation Particle Counter (CPC)*  
**Model and serial number of instrument:** *Österreich UCPC 3022 SN 455*

**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:** *January 24, 2020*  
**Lab temperature and pressure:** *23.45°C, 1001 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/cm<sup>3</sup> in 5 minutes*

**Results (using pulse output):**

<b>Particle size (nm)</b>	<b>40</b>	<b>30</b>	<b>20</b>	<b>10</b>	<b>08</b>
<b>Number concentration (cm-3)</b>	900	1237	1608	843	1318
<b>Counting efficiency <math>\eta</math></b>	0.93	0.93	0.90	0.81	0.75
<b>Particle size (nm)</b>	<b>06</b>				
<b>Number concentration (cm-3)</b>	1063				
<b>Counting efficiency <math>\eta</math></b>	0.63				



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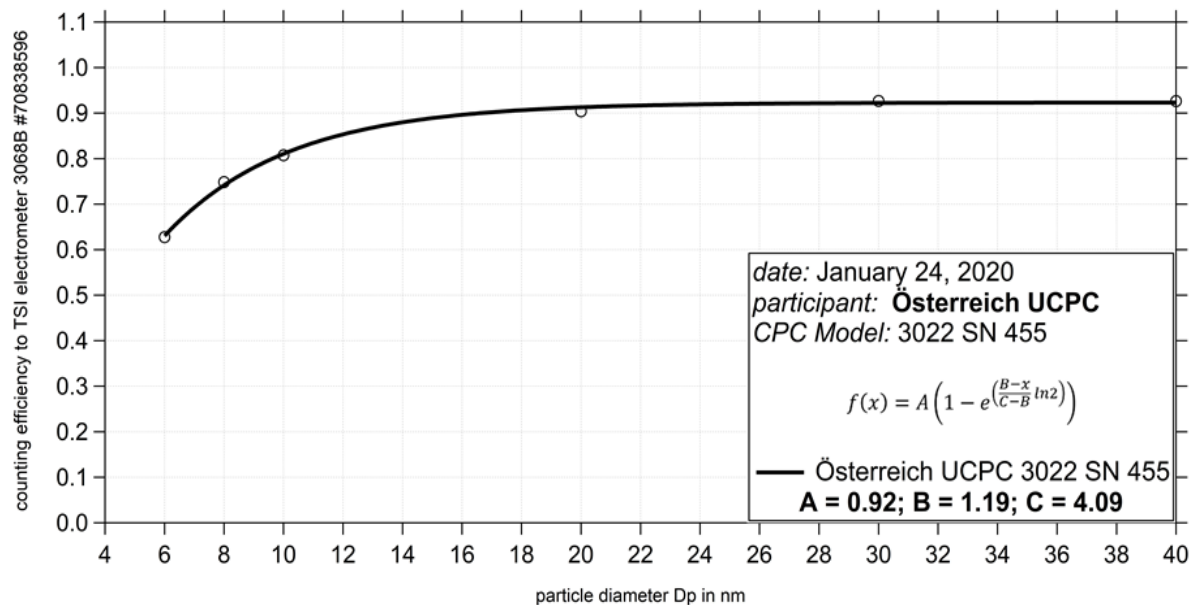


Fig. 1: Counting efficiency for Österreich UCPC 3022 SN 455 CPC against aerosol electrometer 3068 S/N 70838596; silver particles between 6 and 40 nm were used for calibration; the calculated  $D_{p50}$  is 4.09 nm.

**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						
<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					0.3	

**Date of issue:** January 24, 2020

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold