World Calibration Centre
for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

TROPOS
Leibniz Institute for
Tropospheric Research

CPC Model: TSI CPC 3760A

CPC Serial Number: 117

Customer: TSI Instruments Ltd.

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

Date of Calibration: November 24, 2020

Summary of Intercomparison:

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 99% efficiency at 40 nm. The Dp_{50} is at 9.72 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: November 24, 2020 Signature:

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

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Date of arrival of instrument in calibration lab:	*November 16, 2020*
Instrument:	*Condensation Particle Counter*
Model and serial number of instrument:	*CPC 3760A SN 117*
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 with valve*
Model and identification number of aerosol electrometer:	*TSI Electrometer Model 3068, SN 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:	*November 24, 2020*
Lab temperature and pressure:	*23.0°C, 1007 mbar*
Measured aerosol flow rate of CPC:	*1.005 l/min*
Uncertainty in measured flow rate:	*3%*
Flowmeter used:	*Gilian Gilibrator V; SN 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 10 minutes*

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	Unit	Status
Model	-	TSI 3760A
SN	-	117
Firmware	-	-
Date	-	October 1996
TSI Software Version	-	-
Saturator Temperature	°C	-
Condenser Temperature	°C	-
Optics Temperature	°C	-
Cabinet Temperature	°C	-
Ambient Pressure	kPa	-
Vaccuum Pressure	kPa	-
Inlet Pressure	kPa	-
Critical Orifice Pressure	kPa	-
Aerosol Nozzle Pressure	kPa	-
Laser Current	mA	-
Liquid Level	-	full
Aerosol Flow	l/min	1.005
Zero	avg 10 min	0

		BNC (pulse output)		USB-C (direct output)		
Diameter	**EL 3068B (#/cm³)**	**Concentration (#/cm³)**	**Efficiency (µ)**	**Concentration (#/cm³)**	**Efficiency (µ)**	**USB-C / BNC**
40	1361	1343	0.99	-	-	-
40	1314	1300	0.99	-	-	-
30	1489	1465	0.98	-	-	-
20	1570	1541	0.98	-	-	-
15	1261	1157	0.92	-	-	-
14	1818	1575	0.87	-	-	-
12	1751	1281	0.73	-	-	-
11	1354	860	0.64	-	-	-
10	1066	568	0.53	-	-	-
9	1576	584	0.37	-	-	-
8	933	177	0.19	-	-	-
7	1934	106	0.05	-	-	-
6	1503	4	0.00	-	-	-
5	1316	0	0.00	-	-	-

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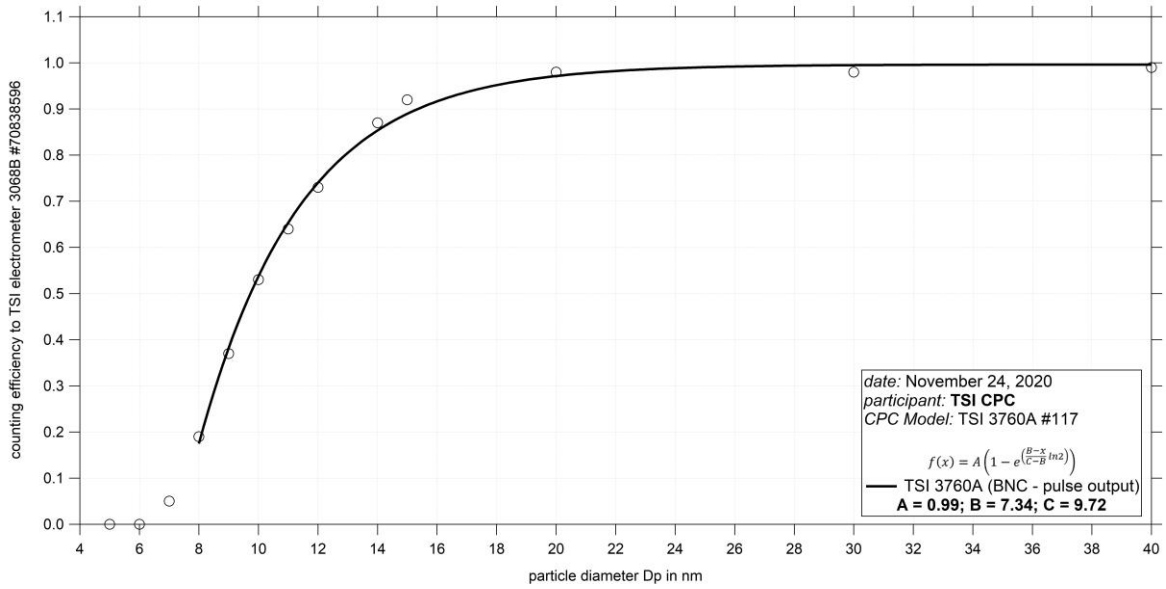

Fig. 1: Counting efficiency for TSI-CPC 3760A SN 117 against aerosol electrometer 3068 SN 70838596; silver particles between 5 nm and 40 nm were used for calibration; the calculated Dp_{50} from the BNC (pulse output) is 9.72 nm.

Date of issue: *November 24, 2020*

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

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