



Leibniz Institute for Tropospheric Research

World Calibration Centre for Aerosol Physics

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

CPC Model:	TSI CPC 3750
CPC Serial Number:	3750183403

Customer: TSI Instruments Ltd.

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

Date of Calibration: March 04, 2020

Summary of Intercomparison:

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 96% efficiency at 40 nm. The Dp50 is at 6.89 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue: March 05, 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: November 26, 2019 Condensation Particle Counter CPC 3750 S/N 3750183403

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"

March 04, 2020 23.0°C, 995.0 mbar 0.997 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 and logging via TROPOS Labview software):

Particle size (nm)	40	30	20	15	10
Number concentration (cm-3)	1305	1244	1451	1249	1298
Counting efficiency η	0.96	0.96	0.96	0.94	0.81
Particle size (nm)	09	08	07	06	05
Number concentration (cm-3)	1341	946	683	418	42
Counting efficiency η	0.75	0.65	0.49	0.29	0.04

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Fig. 1: Counting efficiency for CPC 3750 S/N 3750183403 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated Dp50 is 6.89 nm.

Status information:

Status	T SAT	T CON	Τ ΟΡΤ	T CAB	P AMB	P VAC
from display	39.0	20.2	40.0	24.8	99.4	81.9
Status	P OR	P NO	Laser	LV	flow	P INLET
from display	97.4	2.61	41	full	0.997	-0.4

Results (using pulse output and logging via TROPOS Labview software):

Concentration EM in #/cm ³	71108	56017	42330	25670	17008
Number concentration without					
coincidence correction (cm-3)	53640	43794	34233	21793	14903
Counting efficiency η	0.75	0.79	0.80	0.85	0.88
Concentration EM in #/cm ³	7804				
Number concentration without					
coincidence correction (cm-3)	7142				
Counting efficiency n	0.92				

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Results	(using	USB-C	connection	and logg	ging via	TSI softw	are):

with coincidence correction								
Concentration EM in #/cm ³	71108	56017	42330	25670	17008			
Number concentration with								
coincidence correction (cm-3)	67917	53593	40311	24377	16234			
Counting efficiency η	0.96	0.96	0.95	0.95	0.95			
Concentration EM in #/cm ³	7804							
Number concentration with	7595							
coincidence correction (cm-3)								
Counting efficiency η	0.97							



Fig. 2: Linearity test for TSI CPC 3750 SN 3750183403 against aerosol electrometer 3068 SN 70838596; silver particles with a diameter of 30 nm were used for number concentrations between 8000 and 70000 particles per cm³.

Date of issue: March 05, 2019

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

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