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## Software License

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**Material** AIM11  
Software for TSI Counters and Sizers

**Serial Number** SOFT20180200001



**AEROSOL INSTRUMENT MANAGER® SOFTWARE**  
with remote access to CPCs 375x, multiple instrument control  
and data export

From a web browser, please go to the following link to create your account and download your software.

<http://www.tsi.com/softwarelicensing/>

Enter activation code **a68e-0c2a-d62f-449f-a236-b10d-1d3f-c5aa**

You will need to enter a valid Email account to complete your registration.

If you have any questions, please contact TSI Technical Support at [www.tsi.com](http://www.tsi.com)

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## CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126, U.S.A.  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-654-490-3824 <http://www.tsi.com>

### UNIT UNDER TEST

Manufacturer	TSI Inc. (USA)
Model	3750
Serial Number	3750180101

### ENVIRONMENTAL CONDITIONS

Temperature	24	°C
Humidity	14	%RH
Atmospheric Pressure	100.3	kPa

☒ As Left

☒ In Tolerance

☐ As Found

☐ Out of Tolerance

### FLOW VERIFICATION

Parameter	Units	Value	Allowable Range
Measured Inlet Flow	L/min	0.985	0.950 ~ 1.050

### TEMPERATURE AND PRESSURE VERIFICATION

Parameter	Units	Value	Allowable Range
Saturator Temperature	°C	39.1	38.8 ~ 39.2
Condenser Temperature	°C	18.0	17.8 ~ 18.2
Optics Temperature	°C	40.0	39.8 ~ 40.2
Cabinet Temperature	°C	28.1	20.0 ~ 35.0
Pressure Drop Across Orifice	kPa	83.1	70.0 ~ 88.0
Pressure Drop Across Nozzle	kPa	2.50	2.2 ~ 3.2

### ZERO COUNT TEST

Parameter	Units	Value	Allowable Range
Concentration Average over 12 hours	cm <sup>-3</sup>	0.000	0.000 ~ 0.001

### CONCENTRATION COMPARISON TO STANDARD

Parameter	Units	Value	Allowable Range
Reference Concentration (TSI 3750 CPC)	cm <sup>-3</sup>	2043	—
Measured Concentration	cm <sup>-3</sup>	2060	1500 ~ 2500
Concentration Error	%	0.85	-8.00 ~ 8.00

TSI Incorporated does hereby certify that the above described instrument conforms to the original manufacturer's specifications. The instrument has been calibrated using standards whose accuracies are traceable to National Standards and Metrology Institutes (NIST and NPL UK) within the limitations NIST/NPL UK calibration services or have been derived from accepted values of natural physical constants or have been derived by the ratio type of self-calibration techniques. All test points have a Test Uncertainty Ratio (TUR) of 4:1 or more, except Concentration Comparison to Standard, which has a TUR of 2:1. TSI is registered to ISO-9001:2015. This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the calibration organization issuing this report.

### REFERENCE EQUIPMENT

Reference Device	System ID	Last Cal	Cal Due	Reference Device	System ID	Last Cal	Cal Due
20 cc - 6 L/min Gilibrator Cell	E001598	6/1/2017	6/30/2019	Pressure, Temp, RH Meter	E005657	3/6/2017	3/31/2018
Precision RTD Thermometer	E005205	5/2/2017	5/31/2019	Temp/RH Probe	E005656	3/7/2017	3/31/2018
				TSI 3750 CPC (Ref. Conc.)	E010026	8/22/2017	8/31/2018

*Lisa Engel*

CALIBRATED BY

1/28/2018

DATE OF CALIBRATION





**World Calibration Centre  
for Aerosol Physics**

Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig



**Leibniz Institute for  
Tropospheric Research**

**CPC Model:** TSI CPC 3750

**CPC Serial Number:** 3750180101

**Customer:** TSI Instruments Ltd.

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

**Date of Calibration:** February 20, 2018

Certificate / Reference: WCCAP

Date of issue: February 20, 2018

Signature:

Reviewed by: **TROPOS**

Name: **Kay Weinhold**

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Tropospheric Research

**Date of arrival of instrument in calibration lab:**

**Instrument:**

**Model and serial number of instrument:**

*February 16, 2018*

*Condensation Particle Counter*

*CPC 3750 S/N 3750180101*

**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:**

*April 22, 2016, 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:**

*February 20, 2018*

**Lab temperature and pressure:**

*23°C, 1001.2 mbar*

**Measured aerosol flow rate of CPC:**

*0.972 l/min*

**Uncertainty in measured flow rate:**

*3%*

**Flowmeter used:**

*Gilian Gilibrator V; S/N 1711008-S,  
January 2017*

**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):**

Particle size (nm)	40-1	30	20	15	12
Number concentration (cm-3)	1110	1063	1558	1478	1099
Counting efficiency $\eta$	1.00	0.99	0.96	0.93	0.88
Particle size (nm)	10	09	08	07	06
Number concentration (cm-3)	985	1260	1523	1284	604
Counting efficiency $\eta$	0.83	0.78	0.70	0.60	0.45
Particle size (nm)	05	40-2			
Number concentration (cm-3)	183	1454			
Counting efficiency $\eta$	0.22	1.00			

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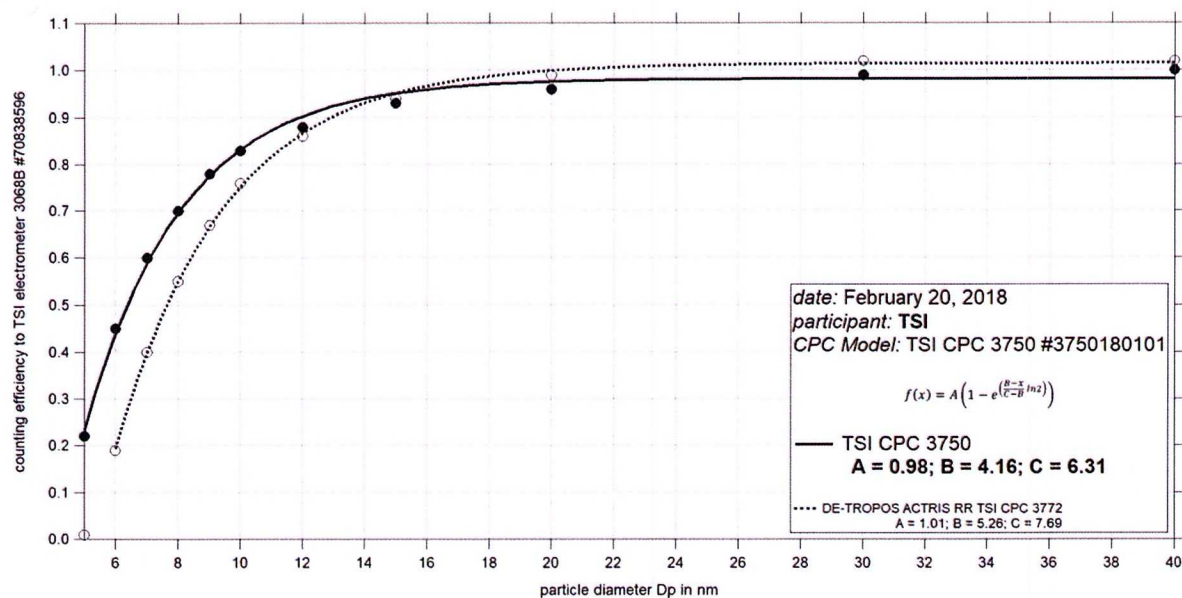


Fig. 1: Counting efficiency for CPC 3750 SN 3750180101 against aerosol electrometer 3068 SN 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated  $D_{p50}$  is 6.31 nm.

#### Status information:

Status	T SAT	T CON	T OPT	T CAB	P AMB
from display	39.0	18.0	40.0	23.0	100.4
Status	P OR	P NO	Laser	LV	flow
from display	72.4	2.5	48	full	0.972

Date of issue: February 20, 2018

Reference: TSI electrometer, model 3068, SN 70838596

Reviewed: TROPOS / Kay Weinhold