



## Intercomparison of Condensation Particle Counter

**Project No.: CPC-2015-2-2**

### **Basic information:**

**Location of the quality assurance:** TROPOS, lab: 130

**Delivery date:** -

**Setup in the laboratory:** November 12, 2015

**Comparison period:** November 12, 2015

Principal Investigator	Home Institution	Participant	Instrument
John Ogren	NOAA/ESRL Global Monitoring Division 325 Broadway R/GMD1 Boulder, CO 80305, USA		TSI CPC Model 3010 # 2326

**TROPOS Reference Instrument:** Electrometer: TSI model 3068B  
# 70838596

### **Additional Equipment:**

- Bubble flow meter 'Giliberator', Gilian (Sensidyne)

## **Summary of Intercomparison:**

### **Pre-status:**

**The TSI CPC 3010 was not in good condition. The CPC was dirty and the optic was mounted in the wrong way.**

### **Final status:**

**The TSI CPC 3010 passed the quality standards of ACTRIS and GAW after cleaning and repairing in TROPOS.**

On October 12, 2015 the NOAA TSI-CPC 3010 participated in the TROPOS ACTRIS-2 CPC-Workshop.

The NOAA TSI-CPC 3010 arrived in a bad condition at TROPOS. It was necessary to clean and fix the optics. The reason was that, after manipulation from NOAA the optic was mounted back in the wrong position. After repairing, the NOAA TSI-CPC passed the quality standards of ACTRIS and GAW.

1. Status of the wick: The wick should be cleaned, because it was dirty and old.
2. Status of the CPC: The CPC was not working properly, repair was necessary.
3. Final CPC-Workshop: The CPC 3010 reached the 100% efficiency at 30 nm. The Dp50 is at 9.5 nm. The CPC efficiency curve corresponds to the standard.

## **06.10.2015, Tuesday – CPC-2015-1 Workshop**

08:00 Stop systems in lab 118 → CPC Workshop in lab 130

09:30 CPC flow measurement

09:48 Zero check over the whole setup

09:50 EM zero adjust

09:52 EM zero adjust

09:57 EM zero adjust

09:59 30nm

10:00 Zero check ok

10:10 **30nm** Start at T = 1160 with vac = 2.25 lpm, conc ~ 2500 p/cm<sup>3</sup>

10:18 **30nm** Stop at T = 1160 with vac = 2.25 lpm, conc ~ 2500 p/cm<sup>3</sup>

10:21 **20nm** Start at T = 1160 with vac = 2.30 lpm, conc ~ 2400 p/cm<sup>3</sup>

10:27 **20nm** Stop at T = 1160 with vac = 2.3 lpm, conc ~ 2400 p/cm<sup>3</sup>

Temperature regulation auf 1100°C

Zero 02 ok

10:43 **15nm** Start at T = 1100 with vac = 2.15 lpm, conc ~ 2100 p/cm<sup>3</sup>

10:48 **15nm** Stop at T = 1100 with vac = 2.15 lpm, conc ~ 2100 p/cm<sup>3</sup>

Temperature regulation auf 1060°C

Zero03 ok

10:59 **13nm** Start at T = 1060 with vac = 1.44 lpm, conc ~ 1900 p/cm<sup>3</sup>

11:05 **13nm** Stop at T = 1060 with vac = 1.44 lpm, conc ~ 1900 p/cm<sup>3</sup>

11:11 **11nm** Start at T = 1060 with vac = 1.7 lpm, conc ~ 2500 p/cm<sup>3</sup>

11:16 **11nm** Stop at T = 1060 with vac = 1.7 lpm, conc ~ 2500 p/cm<sup>3</sup>

11:18 **10nm** Start at T = 1060 with vac = 1.7 lpm, conc ~ 2800 p/cm<sup>3</sup>

11:23 **10nm** Stop at T = 1060 with vac = 1.7 lpm, conc ~ 2800 p/cm<sup>3</sup>

Temperature regulation 1040°C

Zero04 ok

11:31 **9nm** Start at T = 1040 with vac = 1.5 lpm, conc ~ 2000 p/cm<sup>3</sup>

11:36 **9nm** Stop at T = 1040 with vac = 1.5 lpm, conc ~ 2000 p/cm<sup>3</sup>

11:38 **8nm** Start at T = 1040 with vac = 1.5 lpm, conc ~ 2400 p/cm<sup>3</sup>

11:45 **8nm** Stop at T = 1040 with vac = 1.5 lpm, conc ~ 2400 p/cm<sup>3</sup>

Temperature regulation 1020°C

Zero05 ok

11:53 **7nm** Start at T = 1020 with vac = 1.3 lpm, conc ~ 1400 p/cm<sup>3</sup>

12:58 **7nm** Stop at T = 1020 with vac = 1.3 lpm, conc ~ 1400 p/cm<sup>3</sup>

Temperature regulation 1010°C

12:05 **6nm** Start at T = 1010 with vac = 1.15 lpm, conc ~ 1000 p/cm<sup>3</sup>

12:35 **6nm** Stop at T = 1010 with vac = 1.15 lpm, conc ~ 1000 p/cm<sup>3</sup>

Temperature regulation 1000°C

Zero06 ok

12:47 **5nm** Start at T = 1000 with vac = 1.0 lpm, conc ~ 600 p/cm<sup>3</sup>

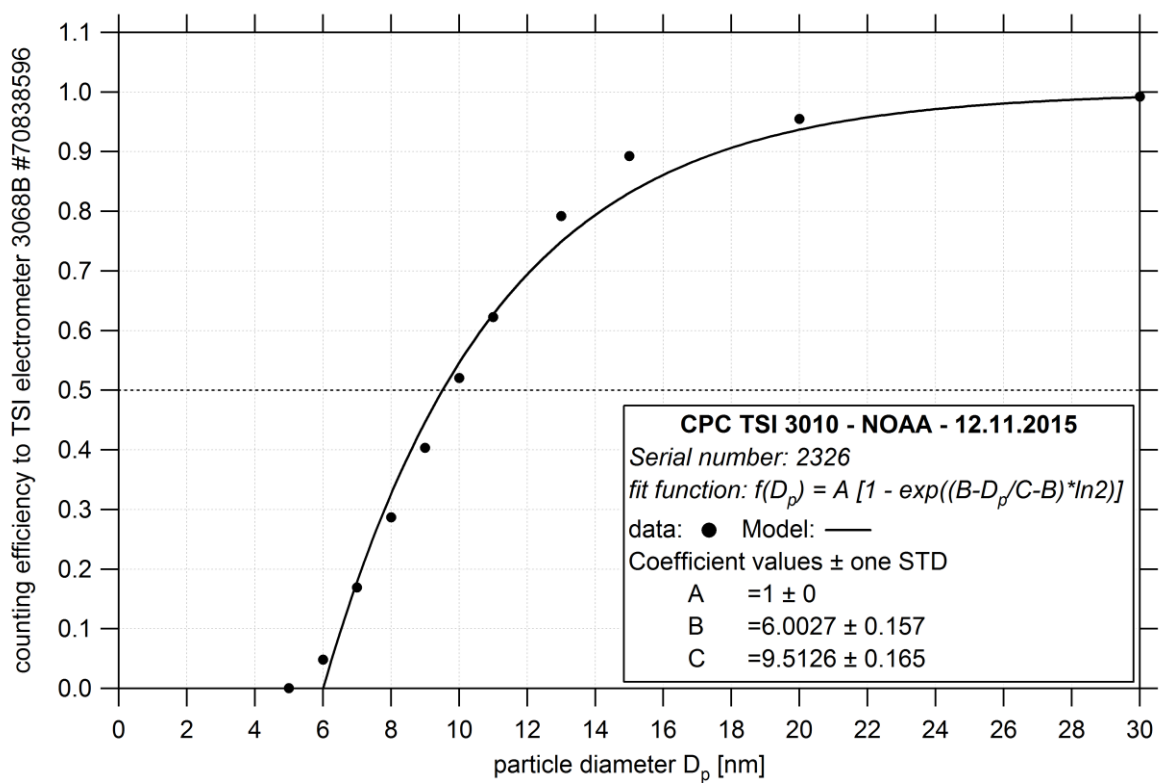
13:00 **5nm** Stop at T = 1000 with vac = 1.0 lpm, conc ~ 600 p/cm<sup>3</sup>

Temperature regulation to 1160°C

Zerocheck07 ok

13:09 **30nm** Start at T = 1160 with vac = 2.22 lpm, conc ~ 2400 p/cm<sup>3</sup>

13:14 **30nm** Stop at T = 1160 with vac = 2.22 lpm, conc ~ 2400 p/cm<sup>3</sup>



**Figure 01:** CPC efficiency curve. Based on Electrometer TSI 3068B. Serial number: 70838596