

Intercomparison of Condensation Particle Counter

Project No.: CPC-2015-1-2

Basic information:

Location of the quality assurance: TROPOS, lab: 130

Delivery date: October 05, 2015

Setup in the laboratory: October 06, 2015

Comparison period: October 06, 2015

| Principal Investigator | Home Institution | Participant | Instrument |
|------------------------|---|--------------------------------------|--|
| Braban, Christine | NERC Centre for Ecology and Hydrology; Bush Estate, Penicuik, EH26 0QB Country: UK | Sarah Leeson, Marsailidh Twigg | TSI CPC Model 3775 # 71105009 (Jan. 2011) |

TROPOS Reference Instrument: Electrometer: TSI model 3068B
70838596

Additional Equipment:

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

Summary of Intercomparison:

Pre-status:

The TSI CPC 3775 was in a good condition, only the wick was changed to a new one.

Final status:

The TSI CPC 3775 passed the quality standards of ACTRIS and GAW.

On October 06, 2015 the UK TSI-CPC 3775 participated the TROPOS ACTRIS-2 CPC-Workshop.

After the Initial-Status, which includes a night measurement against the TROPOS Reference Instrument, of the TSI UK-SMPS from October 05, 2015 to October 06, 2015 the internal CPC-Status were checked and the wick was cleaned.

1. Status of the wick: The wick should be replaced by a new one, because dirty and old.
2. Status of the CPC: The CPC is in a good condition, no repair necessary.
3. CPC-Workshop: The CPC 3775 reached at 30 nm the 100% efficiency. The Dp50 is at 4.5 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/cm³

10:18 **30nm** Stop at T = 1160 with vac = 2.25 lpm, conc ~ 2500 p/cm³

10:21 **20nm** Start at T = 1160 with vac = 2.30 lpm, conc ~ 2400 p/cm³

10:27 **20nm** Stop at T = 1160 with vac = 2.3 lpm, conc ~ 2400 p/cm³

Temperature regulation auf 1100°C

Zero 02 ok

10:43 **15nm** Start at T = 1100 with vac = 2.15 lpm, conc ~ 2100 p/cm³

10:48 **15nm** Stop at T = 1100 with vac = 2.15 lpm, conc ~ 2100 p/cm³

Temperature regulation auf 1060°C

Zero03 ok

10:59 **13nm** Start at T = 1060 with vac = 1.44 lpm, conc ~ 1900 p/cm³

11:05 **13nm** Stop at T = 1060 with vac = 1.44 lpm, conc ~ 1900 p/cm³

11:11 **11nm** Start at T = 1060 with vac = 1.7 lpm, conc ~ 2500 p/cm³

11:16 **11nm** Stop at T = 1060 with vac = 1.7 lpm, conc ~ 2500 p/cm³

11:18 **10nm** Start at T = 1060 with vac = 1.7 lpm, conc ~ 2800 p/cm³

11:23 **10nm** Stop at T = 1060 with vac = 1.7 lpm, conc ~ 2800 p/cm³

Temperature regulation 1040°C

Zero04 ok

11:31 **9nm** Start at T = 1040 with vac = 1.5 lpm, conc ~ 2000 p/cm³

11:36 **9nm** Stop at T = 1040 with vac = 1.5 lpm, conc ~ 2000 p/cm³

11:38 **8nm** Start at T = 1040 with vac = 1.5 lpm, conc ~ 2400 p/cm³

11:45 **8nm** Stop at T = 1040 with vac = 1.5 lpm, conc ~ 2400 p/cm³

Temperature regulation 1020°C

Zero05 ok

11:53 **7nm** Start at T = 1020 with vac = 1.3 lpm, conc ~ 1400 p/cm³

12:58 **7nm** Stop at T = 1020 with vac = 1.3 lpm, conc ~ 1400 p/cm³

Temperature regulation 1010°C

12:05 **6nm** Start at T = 1010 with vac = 1.15 lpm, conc ~ 1000 p/cm³

12:35 **6nm** Stop at T = 1010 with vac = 1.15 lpm, conc ~ 1000 p/cm³

Temperature regulation 1000°C

Zero06 ok

12:47 **5nm** Start at T = 1000 with vac = 1.0 lpm, conc ~ 600 p/cm³

13:00 **5nm** Stop at T = 1000 with vac = 1.0 lpm, conc ~ 600 p/cm³

Temperature regulation to 1160°C

Zerocheck07 ok

13:09 **30nm** Start at T = 1160 with vac = 2.22 lpm, conc ~ 2400 p/cm³

13:14 **30nm** Stop at T = 1160 with vac = 2.22 lpm, conc ~ 2400 p/cm³

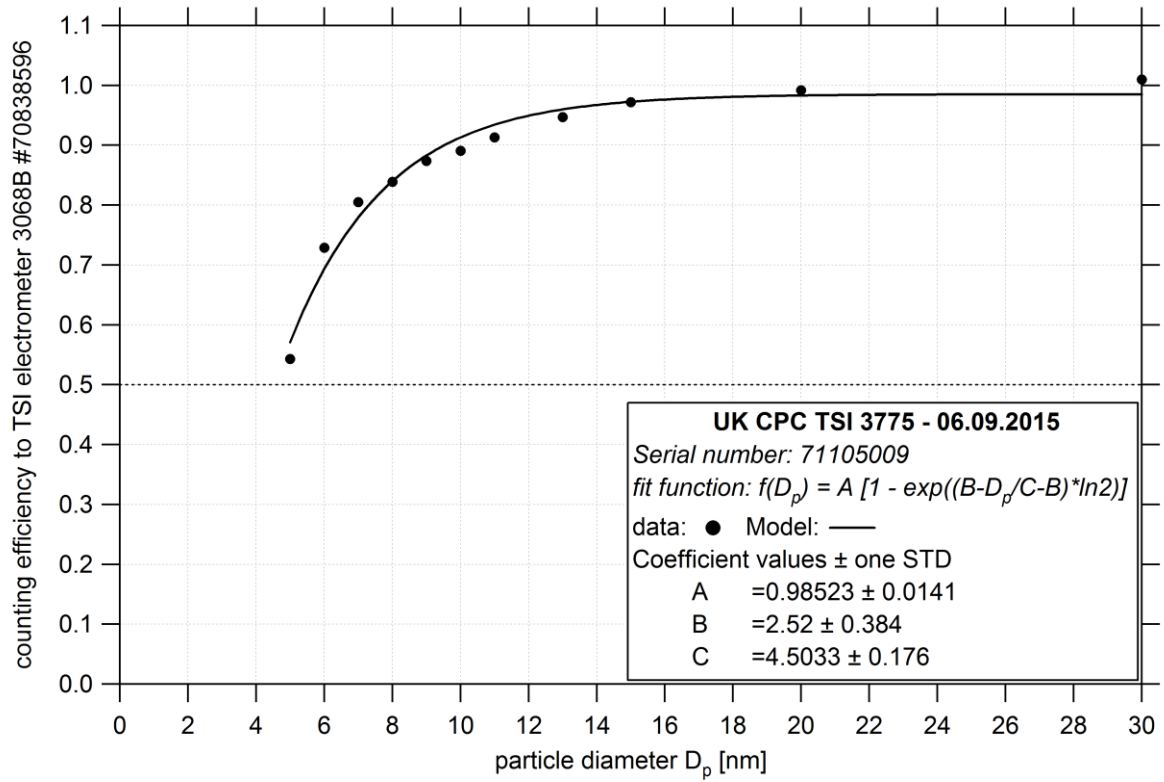


Figure 01: CPC efficiency curve. Based on Electrometer TSI 3068B. Serial number: 70838596