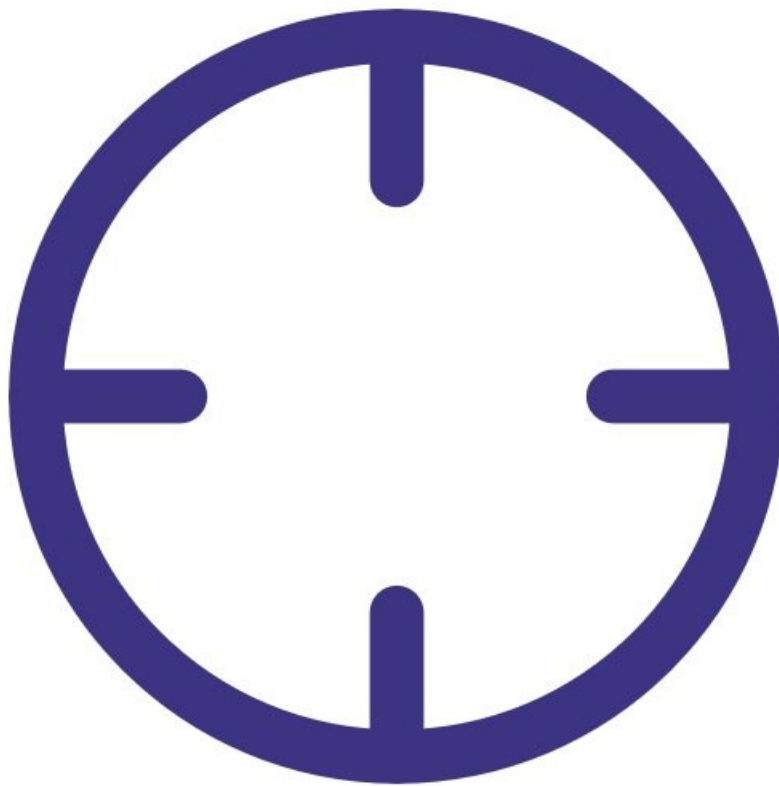




Check zero using external filter

Written By: Tanya Taylor



INTRODUCTION

Use this procedure to check the zero baseline of your particle monitor.

The function of the zero filter is to remove particulate out of the air that's being drawn into the particle inlet.

This means all the air passing through the particle monitor should be free of particulates and particle readings should drop to 0 or close to 0 (within the range $\pm 3 \mu\text{g}/\text{m}^3$).

If you're seeing negative numbers larger than $-3 \mu\text{g}/\text{m}^3$ in your data, it's likely the auto zero cycle isn't working correctly.

Note: You can't fix the zero baseline by adjusting the offset. This is because the particle monitor has an auto zero function that conflicts with the offset function.

To understand how often you should perform this service activity, [click here](#).



PARTS:

- [Zero filter and flow assembly](#) (1)
-

Step 1 — Enter service mode

Calibration and Service ▾ Instrument ▾ Sales & Support Demo AQY (AQY Demo-001) ▾

Normal operation

Calibration

History

Manual Entry >

Manual service mode Start

Calibration parameters

	NO2 ppb	Ox ppb	O3 ppb	O3 raw ppb	PM2.5 raw µg/m ³	PM2.5 µg/m ³	TEMP °C	RH %
Gain	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Offset	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0
a	1.100		2.550					
b			1.870					

Real time measurements

Time	NO2 ppb	Ox ppb	O3 ppb	O3 raw ppb	PM2.5 raw µg/m ³	PM2.5 µg/m ³	TEMP °C	RH %
11:42 a.m.	2.9	29.6	24.2	23.7	1.7	1.1	15.74	86.1
11:41 a.m.	2.8	29.2	24.0	23.5	1.6	1.0	15.63	86.1
11:40 a.m.	3.1	29.7	24.2	23.8	1.9	1.2	15.60	86.1
11:39 a.m.	3.6	30.2	24.1	23.7	1.5	1.0	15.55	87.1
11:38 a.m.	4.7	30.4	23.4	23.0	1.3	0.8	15.48	87.1

- [Enter service mode](#) so any fluctuations in the data caused from this activity can be excluded from air quality reports.

Step 2 — Attach zero filter



⚠ You must do this during normal sample mode, with 2.0 LPM sampling into the particle inlet.

- Remove the TSP head from the top of your monitor's sharp cut cyclone.
- Attach the flow adaptor and zero filter.
- Leave the zero filter in place for 5 minutes.

Step 3 — Check concentrations

The left screenshot shows the 'Diagnostics and Advanced' app. The 'Diagnostics' menu is selected, and a table of PM10 concentrations is displayed. The table has columns for Time, PM10 (µg/m³), Run time (Hours), Pressure (mBar), Laser current (mA), and Raw signal (Hz). The PM10 values are consistently low, around 1.39 µg/m³.

Time	PM10 (µg/m³)	Run time (Hours)	Pressure (mBar)	Laser current (mA)	Raw signal (Hz)
11:42 PM	1.39	7663.000	1017.000	20.800	101.583
11:41 PM	1.39	7663.000	1017.000	20.800	101.833
11:40 PM	1.39	7663.000	1017.000	20.800	104.000
11:39 PM	1.38	7663.000	1017.000	20.800	102.667
11:38 PM	1.38	7663.000	1017.000	20.800	101.667
11:37 PM	1.29	7663.000	1017.000	20.800	103.667
11:36 PM	1.48	7663.000	1017.000	20.800	99.667
11:35 PM	1.36	7663.000	1017.000	20.800	107.167
11:34 PM	1.33	7663.000	1017.000	20.800	103.333
11:33 PM	1.38	7663.000	1017.000	20.800	101.833
11:32 PM	1.40	7663.000	1017.000	20.800	103.167
11:31 PM	1.42	7663.000	1017.000	20.800	100.167
11:30 PM	1.46	7663.000	1017.000	20.800	103.167
11:29 PM	1.41	7663.000	1017.000	20.800	101.500
11:28 PM	1.50	7663.000	1017.000	20.800	102.000
11:27 PM	1.48	7663.000	1017.000	20.800	102.417
11:26 PM	1.42	7663.000	1017.000	20.800	101.500
11:25 PM	1.53	7663.000	1017.000	20.800	101.500
11:24 PM	1.49	7663.000	1017.000	20.800	103.167
11:23 PM	1.34	7663.000	1017.000	20.800	102.750
11:22 PM	1.54	7663.000	1017.000	20.800	103.083

The right screenshot shows the 'Calibration and Service' app. The 'Manual Entry' menu is selected, and the 'Calibration parameters' and 'Real time measurements' sections are visible. The 'Calibration parameters' section shows Gain: 1.000 and Offset: 0.00. The 'Real time measurements' section shows a table of PM10 concentrations and Inlet values.

Time	PM10 (µg/m³)	Inlet
11:41 PM	1.39	Sample
11:40 PM	1.39	Sample
11:39 PM	1.38	Sample
11:38 PM	1.38	Sample
11:37 PM	1.29	Sample
Average	1.37	
Std Dev	0.04	

- To view particle concentrations, open the **Diagnostics and Advanced** app and select **Diagnostics** from the side menu.
- Alternatively, use the **Calibration and Service** app and select **Manual Entry** from the side menu.
- While the zero filter is attached, the **PM µg/m³** values for particle monitor channels should be 0 or close to 0 (between ± 3 µg/m³).
- Compare the values with those taken during the auto zero cycle check. They should be the same or very similar. If they're different, it's possible the sample filter is too dirty or there is a problem with the auto zero cycle.

Step 4 — Run auto zero cycle



- If you're seeing particle matter concentrations larger than $\pm 3 \mu\text{g}/\text{m}^3$, [run the auto zero cycle](#).
- If the auto zero cycle confirms a 0.2 to 0.6 positive flow from the inlet, [check the filters are clean and properly installed](#) and then [leak check the particle monitor using the vacuum gauge](#).
- If this doesn't resolve the issue, contact [Technical Support](#).

Step 5 — Record in journal

Instrument ▾ Air Quality Monitor (AQM65 04082015-437) ▾

All journal types ▾

User entry | Cloud user · John Wagner

1. Site Inspection:	No new local emission sources Instrument in good condition No obstructions to monitoring equipment	2. Instrument inspection: Cooling fan operational PM and gas inlet secure Instrument has been running at stable
3. Equipment:	Aeroqual Gas dilution calibrator: Aircal 1000 Aeroqual Ozone calibrator: AQM O3Cal Aeroqual Flow meter: AQM R7	4 Gas cylinders: CO 1000 ppm in Air (expiry March) SO2 20 ppm in Air (expiry December) NO2 20 ppm in Air (expiry November)
4. Flow rate check:	Expected flow rate = 0.450 ml per min, Measured flow rate = 0.452 ml per min Main inlet flow rate OK, individual module flow rates were not measured.	5. Open door and change gas inlet filter
6. Zero calibration	All modules passed zero calibration, all modules were stable and all offsets were within acceptable limits.	
7. Span Calibration	CO @ 10.00 ppm Module response was 8.95 ppm gain adjustment to 1.15 pass SO2 @ 0.2 ppm Module response was 0.210 ppm gain adjustment to 0.92 pass NO2 @ 0.2 ppm Module response was 0.090 ppm gain adjustment to 2.10 pass (module may need replacing soon contact Aeroqual)	
8 Pack up. Next scheduled calibration 3 months from now. June 2017.		

- [Record the results of this service activity in the monitor's journal.](#)
- [Exit service mode.](#)

For further support, contact [Technical Support](#).