

SIDEPAK™ AM520

PERSONAL AEROSOL MONITOR

FREQUENTLY ASKED QUESTIONS (A4-EMEA)

Can I measure aerosol size fractions with the SidePak AM520 monitor?

Yes. The SidePak AM520 Monitor is supplied with inlet conditioners (impactors) that allow sampling of the following cut points: PM₁₀, PM_{2.5}, PM_{1.0} and PM₅ (Respirable cut point in China). Additionally, the SidePak AM520 is supplied with a 10 mm Nylon Dorr-Oliver Cyclone for respirable sampling with a 4 µm cut point. A 0.8 µm cyclone is connected to the Dorr-Oliver cyclone to measure Diesel Particulate Matter (DPM) size fraction.

The Dorr-Oliver Cyclone, 0.8 DPM cyclone and impactors are designed to operate at a flow rate of 1.7 L/min.

Can I measure respirable aerosol mass concentration with the SidePak AM520 monitor?

Yes. The SidePak AM520 Monitor is supplied with a 10 mm Nylon Dorr-Oliver Cyclone which provides a particle size fraction cut-point of 4 µm (internationally accepted as the 50% cut-off size for respirable aerosol mass).

Can I use a different cyclone on the SidePak AM520 Monitor?

Yes. The flow rate of the SidePak AM520 Monitor may need to be and can be adjusted to the rate specified with the new cyclone. The SidePak AM520 Monitor's flow rate can be adjusted between 0.7 and 1.8 L/minute. Therefore, the cyclone must operate within these flow rates.

Can I use the SidePak AM520 monitor outdoors?

Yes. The SidePak AM520 Monitor has been used outdoors but it is not considered weatherproof. To clarify, it is not suitable for long-term, unattended operation in harsh environmental conditions (i.e., rain, snow, etc.).

What is the effect of relative humidity (%RH) on the performance of the SidePak AM520 monitor?

Several research studies are published that discuss the effect of humidity on photometric aerosol mass measurement. In humidity above 50%, many aerosols will swell in size. These larger aerosols scatter more light inside the photometric instrument. Often times a photometric instrument will overstate the mass of an aerosol compared to its gravimetric weight due to humid conditions.

[“Characterizing Indoor and Outdoor 15 Minute Average PM_{2.5} Concentrations in Urban Neighborhoods.”](#) Gurumurthy Ramachandran,¹ John L. Adgate,¹ Gregory C. Pratt,² and Ken Sexton¹.

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What is the measurement range of the SidePak AM520 monitor?

The mass concentration range is 0.001 to 100 mg/m³.

What particle size does the SidePak AM520 monitor measure?

The particle size range is 0.1 to 10 µm.

What is the warm-up time of the SidePak AM520 monitor?

When the SidePak AM520 Monitor is first turned on, it takes about a minute for the instrument to settle down to a stable reading. After warm-up, stable readings can be obtained in 10 to 15 seconds.

What type of device is the SidePak AM520 monitor?

The SidePak AM520 Monitor is a light-scattering laser photometer. The sensing mechanism consists of a laser diode directed at the aerosol stream. Scattered light is collected with optics and a photo detector at 90° to the light beam. The intensity of the scattered light is a function of the particle mass concentration.

What is the battery run time for the SidePak AM520 monitor?

The battery is a 5400 mAh Li-On battery that provides 20 hours of run time. Impactors and cold temperatures will reduce the battery run time.

How long does it take the battery to charge?

Battery charge time is 4 hours.

Does the SidePak AM520 monitor have an audible alarm to warn workers of high dust levels?

Yes. A 95 dB audible alarm sounds and visible red LED lights on the face of the instrument blink when the alarm level is reached.

Does the SidePak AM520 monitor comply with the NIOSH analytical methods 0500 and 0600 or other local occupational health and safety regulations globally?

No. NIOSH 0500 and 0600 or other local occupational health and safety regulations globally are analytical methods for gravimetric collection and analysis of dust not otherwise categorized. The SidePak AM520 Monitor is not a gravimetric sample pump. It is a light scattering photometer that measures aerosol mass by light scattering compared to a calibration aerosol in real time.

How do I calibrate the SidePak AM520 monitor in the field?

Performing a daily zero check with the included Zero Filter to ensure the instrument reads zero when no aerosol is present is the only daily calibration check required. It is very difficult to generate a known aerosol concentration for a “bump test” in the field without very sophisticated equipment. With use of multiple SidePak AM520 Monitors, running them side by side after conducting the zero check is a good way to determine functionality. If all instruments are within 20% of each other, they are all functioning properly.

How do I set alarms on the SidePak AM520 monitor?

Five preset alarm levels can be selected from the set up screen on the instrument. TrakPro™ Software can be used on a computer to set alarm levels from 0.001 to 999 mg/m³ to be loaded into the instrument.

If the instrument range is 0 to 100 mg/m³, why can I program an alarm setting for 999 mg/m³?

The full scale reading of the instrument can change based on the calibration factor being used. A calibration factor of 2.0 changes the maximum full scale reading to 200 mg/m³. Calibration factor from 0.1 to 10 can be used. A Cal Factor of 10 will extend the full scale range to 1000 mg/m³.

How do I maintain the batteries on my SidePak AM520 monitor?

- LiOn batteries must be recharged after each use.
- Recharge the batteries at least every 6 months when instrument is not being used.
- Remove the battery from the instrument for long-term storage to prevent power drain.
- Store batteries in a cool, dry place.

What custom calibration factor (k-factor) should I use for the aerosol I am sampling at my location?

Factory calibration with a Photometric Calibration Factor (PCF) of 1.0 is the best starting point. The factory calibration to A1 Test Dust represents most industrial dust. A PCF of 0.38 should be used for ambient aerosol present in the urban environment.

Should I even use the SidePak AM520 monitor if I do not have a custom photometric calibration factor (k-factor) established for my aerosol?

A light scattering photometric instrument will never be used to identify compliance with the OSHA Permissible Exposure Level. This is because the photometer measures light scattering which varies between materials. The photometer is not able to distinguish between different aerosol light scattering properties. With that in mind, the photometer still provides a very repeatable measurement with data that is logged. Printing this logged data on a spreadsheet can often indicate concentration peaks and trends that cannot be determined by OSHA reference methods (for e.g.) using gravimetric and analytical sampling.

What is the difference between the 4 µm respirable cyclone and the PM5 cyclone for china respirable dust?

The cut points are designed to cut out 50% of the particles larger than the designated cut point. U.S. OSHA, and other local occupational health and safety regulations globally refers to respirable aerosol as having a 4 µm cut point. China defines a respirable cut point at 5 µm. The impactors work the same way by cutting out particles at 4 µm vs. 5 µm size fraction.

What is the efficiency rating for the impactors?

See application note EXPMN-012–“SidePak AM520 and AM520i Personal Aerosol Monitor Cyclone and Impactor Penetration Efficiency Curves” for cyclone and impactor penetration efficiency curves.

Can I use the SidePak AM520 monitor to collect dust samples on a filter cassette?

No. The SidePak AM520 Monitor is not designed to collect dust samples on a filter cassette. The pump inside this instrument is not designed to accommodate for the high pressure drops associated with aerosol buildup on filter media.

How often does the impactor need to be cleaned?

The impactor should be cleaned prior to each use. Remove the impactor inlet and blow out any residue from the inlet. Use a light solvent (not water) to remove any accumulated aerosol from the impactor disk. After impactor disk is dry, apply two drops of impactor oil and reinstall.

What logging interval should I use?

This depends on how stable the process is you are measuring and how much data you want to collect. The SidePak AM520 Monitor takes a sample every second. Logging intervals can be set using the up and down arrows to 1 sec, 1 min, 5 min, 15 min or 30 min.

- For sample runs less than 1 hour, a 1 second logging average is recommended.
- For sample runs between 1 and 4 hours, a 1 minute logging interval is recommended.
- For sample runs longer than 8 hours, a 5 minute or longer logging interval is recommended.

What readings does the set alarm level follow?

The alarm level is based on the readings on the display, or the time constant. A time constant is a rolling average. Setting the time constant to 30 seconds will display a rolling 30-second average on the screen that is updated with new data every second. Any alarm set will activate when the time constant reaches the alarm set point.



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