

WINS Impactor PM_{2.5} Inlet Instructions

Overview:

The WINS Impactor (*Well Impactor Ninety Six*) is the US EPA PM_{2.5} Reference Method particle separator as specified by US federal regulations. Although the WINS Impactor has been replaced by PM_{2.5} cyclones in some applications, it is still used in many regions where specified by regulations. Alaric model WINS is a high-quality modern production version of this inlet.

Airborne particles larger than 2.5 microns are trapped inside the WINS impactor well on an oil-infused glass fiber filter disc and are excluded from the sample air flow path, while the smaller particulate passes through to the sampling instrument. The design has been tested and characterized by the US EPA, and is rated for a D50 cut-point of 2.5 microns when operated at an airflow rate of 16.7 L/min.

Setup & Assembly:

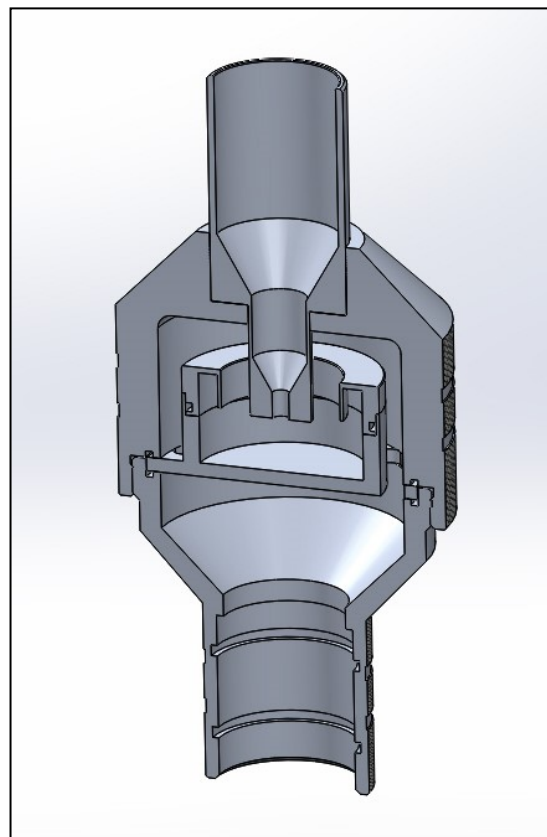
The WINS Inlet assembly consists of an upper body section and a lower body section that thread together, and an internal impactor well with a well cap. We provide unique knurled bands on the outside of the body to make opening the threaded body joint easier.

The WINS Impactor is designed to always be used under (down-stream) of a 16.7 L/min PM₁₀ inlet (such as Alaric model PM10L or equivalent) which serves as the primary air inlet and traps water, debris, and large particles. The top of the WINS can be inserted directly into the bottom of the PM₁₀ inlet (outside of the sampling instrument enclosure) for some continuous particulate monitor applications. However, for reference method PM_{2.5} sampler applications, the WINS is installed inside the instrument enclosure, and the PM₁₀ inlet is installed outside the enclosure with a sample tube separating the two devices.

The bottom of the WINS must be connected to the top of a sample filter cassette holder inside the sampler, or to the top of the inlet tube of a continuous monitor. The WINS uses standard 1.25 inch diameter socket and tenon. Consult your instrument manual to verify correct inlet stack configuration.

Maintenance:

The Impactor Well located inside the WINS body is where the particles larger than 2.5 microns accumulate. **This well must be cleaned and have a new filter substrate and DOS oil installed at least every five sample days in most normal conditions. During use in high PM concentrations, the well may need to be cleaned every day.** Failure to clean the well will result in reduced particle trapping performance of the inlet.



1. Unscrew the main WINS body joint and remove the internal well assembly. Pull the well cap out of the top of the lower well. It is held in place only by o-ring friction.
2. Remove and discard the dirty 37mm filter disc. Wipe the inside of the lower well clean with a soft rag. If the well is very dirty, clean it with cleaning solvent or soapy water. It may be ultrasonically cleaned, though this is usually not necessary. Make sure the well is completely dry before proceeding.
3. Install a new 37mm glass fiber filter disc into the bottom of the impactor well. This serves as a proper substrate for the DOS oil, and the WINS Impactor must not be operated without a filter disc in place. Alaric can supply packs of the replacement 37mm filter discs as part number 10068. Some users obtain the discs elsewhere.
4. Using a pipette or other suitable applicator, apply 1.0 mL $\pm$ 0.1 mL of DOS (Dioctyl Sebacate, CAS 122-62-3) diffusion oil onto the filter disc. Some users prefer to put the oil into the well first, then place the filter on top of it. In either case, make sure the filter is evenly saturated with the DOS oil. Alaric can supply DOS oil in 120 mL bottles or 500 mL bottles. Some users obtain the DOS oil elsewhere.



Note: The EPA previously specified DOW 704 silicone oil for use in WINS Impactors. This practice was discontinued several years ago because the 704 oil was documented to solidify under certain conditions. Alaric can supply additional EPA documentation about this change if requested.

5. Lubricate the well o-ring with silicone o-ring grease if necessary, and snap the well cap into the top of the lower well. Install the well assembly inside the WINS lower body. Make sure the threads in the WINS body are clean, and the two large body o-rings are in good condition before screwing the body back together.

Note: Some agencies keep extra well assemblies in stock, and simply exchange the entire well rather than cleaning the dirty one in the field.

6. Reinstall the WINS Impactor assembly into the sampler or inlet stack.

Parts & Warranty:

Spare well assemblies, replacement o-rings, DOS oil, and filter discs are available from Alaric. In most cases these parts are interchangeable with WINS Impactors from other manufacturers. Contact us for more information.

This product manufactured by Alaric Electromechanics Inc. is guaranteed against defects in materials and workmanship for a period of 1 year from the date of original purchase. Items or components found to be defective within the warranty period will be repaired or replaced at the sole option of the warrantor. The total liability of Alaric Electromechanics Inc. shall not exceed the purchase price of the product. This warranty does not cover damage to items that have been subjected to abuse, negligence, improper installation or use, vandalism, unauthorized modification, accidents, toxic contamination, or acts of nature. This warranty does not cover consumable or routine maintenance items, including but not limited to o-rings etc. No other warranties are expressed or implied. Alaric Electromechanics Inc. is not liable for any indirect, incidental, or consequential damages or losses arising from the use or failure of any item. Some states do not allow exclusion or limitation of incidental or consequential damages, so some of the limitations or exclusions may not apply. There may be additional warranty rights that vary by state or country.