

**STATEWIDE
STANDARD OPERATING PROCEDURE
FOR
THERMO ENVIRONMENTAL INSTRUMENTS
PARTISOL-PLUS MODEL 2025i
SEQUENTIAL AIR SAMPLER**



**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR MONITORING**

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1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish uniform procedures pertaining to the operation and maintenance of the Thermo Environmental Instruments (TEI) Partisol™ 2025i Sequential Air Sampler (2025i) used to measure mass concentrations of airborne particulate matter. This operation and maintenance is performed by site operators under the direction of both the Florida DEP and designated local programs. The routine procedures outlined within this SOP are performed as a means of evaluating the functionality and operability of the 2025i, ensuring that it continues to operate in an error free state and that it provides high quality, legally defensible data.

The procedures described herein are based on requirements set forth in the manufacturer's manual, the Code of Federal Regulations, and the statewide PM2.5 Quality Assurance Project Plan (QAPP). The operator must use these procedures during routine, periodic, and calibration visits to the monitoring site. The final data are verified and submitted to the Florida Air Monitoring Assessment System (FAMAS), then uploaded by the Florida Department of Environmental Protection (FDEP) to the US EPA Air Quality System (AQS).

2.0 SCOPE AND APPLICABILITY

The purpose of this SOP is to provide a set of uniform protocols for installation, operation, maintenance, calibration, quality control (QC), and quality assurance (QA) of the TEI Model 2025i particulate matter (PM) sampler. The procedures are based on instructions set forth in the manufacturer's manual; requirements specified in Appendix A to 40 CFR Part 58, and the FDEP Quality Assurance Project Plan. They are intended for use by the operator during routine, periodic, and unscheduled visits to the monitoring station.

All operations, maintenance, and procedures outlined in this SOP will be for the Model 2025i configured for sampling particulate matter of 2.5 microns or less (PM_{2.5}). The sampler may be configured to collect PM₁₀ (10 microns or less); see the manufacturer's operating manual for more information.

3.0 SUMMARY OF THE METHOD

The TEI (formerly known as Rupprecht and Patashnick (R&P)), 2025i Partisol™ Sequential Air Sampler has received EPA designation as a Federal Reference Method, RFPS-0498-118 for sampling PM_{2.5}, or RFPS-1298-127 for sampling PM₁₀ when operated with software version 1.003 or later approved versions, for 24-hour continuous sample periods, in accordance with the Model 2025i operating manual and with the requirements and sample filters specified in 40 CFR (Code of Federal Regulation) Part 50 Appendix L. The State of Florida and its local agencies use software version 1.202 or later.

The operating principles of the Model 2025i Partisol™ Sequential Air Sampler are summarized:

- Operators should refer to Chapter 1 of the 2025i Operating Manual, dated 14 April 2015, or the latest available version. The system flow schematic shows a first-stage PM₁₀ inlet followed by a particle size separator (also called a fractionator) which may also be the BGI Very Sharp Cut Cyclone (VSCC)™ particle size separator specified as part of EPA-designated equivalent method EQPM-0202-145 (67 FR 15567, April 2, 2002) and as manufactured by BGI Incorporated, 58 Guinan Street, Waltham, Massachusetts 20451. No change in the reference method designation is required when using the sampler configured with the VSCC fractionator.
- To collect particulate matter, ambient air is drawn through a 47-mm Teflon filter housed in a filter cassette. The laboratory installs the cassettes into a supply magazine with a capacity of up to 16 filters. The supply magazine contains pre-weighed, preconditioned filters to be used for collection. The storage magazine receives exposed filters. The use of filter magazines simplifies filter exchange and transport and minimizes the risk of contamination during these procedures. Filter magazines may be exchanged while the unit is sampling. During filter exchange, the sampler pushes filter cassettes contained in the supply magazine upward and to the right, while the already exposed filter shuttles rightward and down to the storage magazine.
- An in-line filter downstream of the sample filter protects the mass flow controller from any particles that may remain in the airflow. The mass flow controller operates under the control of the sampler's microprocessor, and maintains the sample stream at a constant volumetric flow rate (usually 16.67 liters per minute (l/min)) based on ambient temperature and pressure measurements. There is an accumulator downstream from the flow controller to minimize pulsations caused by the vacuum pump. The sampling system determines the ambient temperature and pressure for flow rate calculations through sensors that continually provide updated information to the microprocessor system. The mass flow controller's factory calibration is referenced to conditions of 0° C and a pressure of 1 atmosphere. To sample at the correct volumetric flow rate, the sampler makes use of the measured ambient temperature and pressure. Using this information, the microprocessor

calculates the correct mass flow set point required to achieve the desired volumetric flow setting.

- Mass concentration data reported to U.S. EPA must be in units of micrograms per volumetric cubic meters ($\mu\text{g}/\text{m}^3$), calculated from filter gravimetric data and integration of the volumetric flow rate over the sampling period. The sampler automatically determines the sampled volume in volumetric or standard m^3 for each filter exposed and stores this information internally for later viewing or downloading.

4.0 DEFINITIONS AND CONVERSION FACTORS

Technical terms in this SOP are defined as they are introduced so that their meaning is made clear in context. This section defines some general terminology and applicable conversion factor(s) for this SOP.

Audit - is often used in a generic way to mean check, inspect, examine, or assess, and many SOPs use the term to refer to QC procedures, such as flow checks or leak checks, that are carried out by field operators during the course of normal operations and maintenance.

Calibration - refers to the act of adjusting an instrument after comparison with a standard. When referring to the instrument software, the term “calibration” is used to indicate a procedure that would alter instrument output. A “calibration check” (also called a verification) involves only the checking of an instrument against a standard and involves no adjustment of the instrument.

Conversion factors applicable to this SOP:

- A. 1 atm = 760 mm Hg
- B. 1 millibars = 0.75012 mm Hg
- C. 1 in Hg (i.e., inches of mercury) at 32° F = 25.4 mm Hg

Quality control (QC) - refers to the operational techniques and activities used to fulfill the requirements for quality.

Quality assurance (QA) - refers to the planned or systematic activities used to provide confidence that the requirements for quality are fulfilled. An independent audit is an example of a QA activity. QA protocols determine whether the QC procedures are adequate.

Verification - review of interim work steps to ensure they are acceptable and to determine whether the system is consistent, adheres to standards, uses reliable techniques, and performs the selected functions in the correct manner. The term is also used to distinguish a calibration check from a calibration adjustment.

Validation - determining whether the system complies with requirements, performs the functions for which it is intended, and meets the organization’s goals and user needs. It is a determination of correctness of the data and is usually performed only periodically (e.g., quarterly) or at the end of a project.

Warning Limit (WL) – the relative percent difference between the theoretical value and the instrument response value which is less than, but approaching, out-of-tolerance conditions (“control limit” values) requiring further investigation and possible corrective actions.

5.0 HEALTH AND SAFETY PRECAUTIONS

Safety precautions should be heeded during the setup and operation of the 2025i. General safety rules regarding electricity and power tools should be observed. High voltages may be present in all instrument enclosures. When accessing these enclosures, disconnect the power cord from the power source unless power is specifically required for the service procedure. Instrument is supplied with a grounded three-prong plug designed for outdoor use. When operating the instrument outdoors, be sure that it is plugged into a properly rated exterior (outdoor) outlet.

When lifting the instrument, use a procedure appropriate to lifting a heavy object, such as bending at the knees while keeping your back straight and upright. Two people should be used for lifting, one by grasping the bottom in the front and the other by grasping the bottom in the rear. The PartisolTM stand must be anchored when installed outdoors to prevent tipping of the sampler and/or stand in high winds.

Some assembly of the inlet and fractionator is required for installation and regular maintenance. Be careful to avoid pinching your fingers between the assembly parts when assembling the fractionator or inlet. Never place your hands or fingers in the filter exchange mechanism. Refer to the 2025i operating manual for instructions on clearing a filter jam.

6.0 INTERFERENCES

Although the design of the sampler inlet and fractionator separates large extraneous objects such as insects from the sample stream, these may be swept into the filter. In addition, the operator shall be aware that liquid aerosols, such as oil mists and fog droplets, are retained by the filter. If the amount of liquid collected is sizeable, the filter can become wet and its function may be impaired.

As the filter becomes loaded with collected matter, the sampling rate is reduced. If a significant drop in flow rate occurs, the average of the initial and final flow rate will not give an accurate estimate of total flow during the sampling period. The magnitude of such errors will depend on the amount of reduction of airflow rate and on the variation of the mass concentration of dust with time during the 24-h sampling period.

Other interferences include power failures or voltage change during the sampling period may lead to an error, depending on the extent and time duration of such failures. Also, the weight changes of the filter left in place for any time prior to or following a sampling period can introduce an error. The timely installation and removal of the filter is advisable.

7.0 PERSONNEL QUALIFICATIONS

A basic understanding of the principles governing ambient air sampling is necessary. All field operations personnel should be familiar with environmental field measurement techniques. Those who service the analyzer in the field must be very conscientious and attentive to detail to report complete and high-quality environmental data. Installation, operation, maintenance, repair and calibration of the instrument and all support equipment should only be performed by properly trained personnel. The training will be provided by in-house personnel, state, or federal agencies when available. The training documentation will be maintained by the state or local agency where the personnel operate. Persons qualified to perform measurements of ambient particulate matter concentrations should be able to:

- a) Operate, program, and retrieve data from the 2025i sampler;
- b) Calibrate, maintain, and troubleshoot the 2025i sampler; and
- c) Store, handle, transport, document, ship and receive filters.

Operators are also required to read the manufacturer's instruction manuals supplied with the sampler and supporting calibration equipment to become familiar with the various controls and components prior to attempting any operation described in this procedure. The manufacturer's manuals contain useful operation, maintenance, and diagnostic information that may not be contained in this SOP.

8.0 EQUIPMENT AND SUPPLIES

Sampler Log Book – Each Partisol™ 2025i sampler will have a dedicated log book. The log book will consist of a collection of paper or electronic versions of the forms in Appendix A of this SOP and used appropriately according to the instructions for the form and directions contained within the SOP. When complete, the operator will sign, date, and submit the calibration form to QA Staff for review and document retention in the agency Document Management System.

In addition, Table 8-1 lists the recommended tools, spare parts, and cleaning supplies necessary for the operation and maintenance of the 2025i.

Table 8-1. Equipment and Supplies

Category	Components
Diagnostic tools	Flow calibrator(s)
	Flow audit adapter
	Temperature transfer standard
	Pressure transfer standard
	Digital multi-meter
	Audit filter and cassette
	Hand tools (screwdrivers, wrenches, small sizes, etc.)
Recommended spare parts	Pump rebuild kit
	VSCC O-ring package
	V-seals
	Foam fan covers
Cleaning supplies	Silicon based stopcock grease
	Soap, alcohol or Freon solution
	Small soft-bristle brush
	Cotton swabs
	Paper towels, soft cloth
	Deionized (DI) water

9.0 INITIAL SAMPLER INSTALLATION AND START UP

9.1 Site Selection

Sites for the sampler must meet the U.S. EPA criteria contained in 40 CFR 58, Appendix E. These criteria, among others include:

- A. Horizontal and Vertical Placement
- B. Spacing from Minor Sources
- C. Spacing from Obstructions
- D. Spacing from Trees
- E. Spacing from Roadways

The site should also be selected considering ease of access, security for the equipment, and room for an audit sampler.

9.2 Sampler Setup

The agency's maintenance and support group, or an experienced field technician, will follow the procedures in Chapter 2 of the manufacturer's Instruction Manual to assemble the sampler and stand (the quick start guide provided with the sampler should also be referenced). Ensure the sampler and the stand are securely fastened to the supporting structure.

Prior to ambient sampling, follow the manufacturer's directions to program the sampler settings and complete instrument setup. Ensure that the sampler is set to the following options: basic 24-hour continuous sampling, filter type T, flow rate 16.7 L/min, average temp of '99', average pressure of '999', fan on auto, set date, time to standard time, set Site ID 1 and 2 for the correct output for FDEP database.

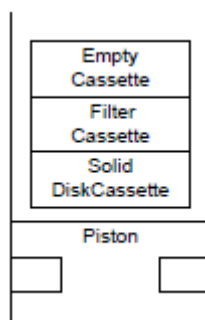
The following verifications are to be performed by the agency's maintenance and support group or an experienced field technician. Documentation of the results of these verifications, and calibrations if necessary, will be made on the appropriate form(s) contained within the sampler log book and retained in the agency's document management system. These verifications (which are to be performed in the following order) and their processes are discussed in the following subsections.

9.3 Loading the Audit Magazine

Note: Following initial set up of the sampler, the audit magazine may be left at the site, placed inside and to the back of the sampler so as to not interfere with sampling.

Install an audit magazine with an empty cassette (no screen), an external leak check cassette (with a 47mm filter) and an internal leak check cassette (with a solid filter leak check/separator disk) into an empty magazine.

Figure 9-1. Loaded Audit Magazine



The empty cassette should be in the topmost position as shown in Figure 9-1. Install the audit magazine in the left side of the enclosure and a clean empty storage magazine on the right side of the enclosure to collect audit cassettes.

Remove the 1st stage inlet and the sampler downtube by pulling straight up on the sampler downtube. Unlatch and open the sampler's top cover. Pull straight up to remove the VSCC.

Figure 9-2. Front Panel Key Descriptions

Name	Key	Description
Power Switch		Main power control for the analyzer. Rock it to the ON or OFF position.
RUN		Use to display the current concentrations on the run screen and takes you out of menu options
MENU		Use to display the Main Menu operation selections and submenu screens.
ENTER		Use to select a menu item, save an entry, or toggle on/off functions.
ARROW		Use to move the cursor, navigate between options, or increase/decrease numerical values as needed.
HELP		Press to see additional information about the screen being displayed
SOFT		Located directly under the display screen, these keys provide shortcuts to the functions listed on the bottom of the display. These shortcuts can be user-selected.

9.4 Ambient Probe Verification

The ambient air temperature verification is a three-point verification that is performed at initial sampler setup and annually thereafter.

- 9.4.1 From the sampler's Main Menu (press the Menu button to display), scroll (using the arrow buttons) to Audit and Calibration and press [Enter].
- 9.4.2 With the cursor at Audit Mode, under the Audit and Calibration menu, press [Enter]. Press right arrow to Confirm.
- 9.4.3 Once in Audit Mode, scroll to Advance Filter and press [Enter]. Press right arrow to Confirm. This will advance the empty cassette from the audit magazine into the sampling position of the sampler.
- 9.4.4 Once the Advance Filter step has been completed, scroll down to Audit and press [Enter]. This will display the temperatures and pressures of the sampler.
- 9.4.5 Perform a three-point temperature verification (hot, cold, and ambient). The reference and sampler probe should be banded together and immersed to the same depth in an insulated constant temperature bath or block. Allow the temperature to equilibrate for at least 5 minutes prior to measuring the temperature. Verify that the Ambient Temperature displayed is within $\pm 1^{\circ}\text{C}$ of the measured temperature of the transfer standard. Document the reference temperature and sampler unadjusted three-point temperatures on form DEP 03-15-A Temperature and Pressure Verification/Calibration. If the reference and sampler's ambient temperature exceed this limit, follow steps in Section 10 of this SOP for Ambient Temperature Calibration.

Note: Form DEP 03-15-A Temperature and Pressure Verification/Calibration is used to document this verification at initial installation, annual verification, and calibration, if needed.

9.5 Filter Temperature Probe Verification

The filter temperature verification is performed at initial sampler setup and annually thereafter. The filter temperature is displayed on the same screen beneath the ambient temperature.

- 9.5.1 Upon initial sampler setup, perform a three-point temperature verification by disconnecting the probe from the filter chamber and immersing it into temperature baths (hot, cold, and ambient) with the transfer standard probe. Verify that the Filter Temperature displayed is within $\pm 1^{\circ}\text{C}$ of the measured temperature of the transfer standard. Document these readings on form DEP 03-15-A Temperature and Pressure Verification/Calibration. If this limit is exceeded, follow steps in Section 10 of this SOP for Filter Temperature Calibration. Reinstall the filter probe in the sampling chamber and verify filter temperature at ambient by inserting the transfer standard through the empty cassette (open top cover). Verify no leaks were introduced by conducting an Internal Leak Check with a solid leak check disk advanced into the sampling chamber.

Note: Form DEP 03-15-A Temperature and Pressure Verification/Calibration is used to document this verification at initial installation, annual verification, and calibration, if needed.

For subsequent annual verifications, only an ambient temperature point should be verified against the reference standard, as disconnecting the probe from the filter mechanism housing in the field is discouraged by the manufacturer. If the initial attempt at the single-point verification is unsuccessful, first try again with a different transfer standard.

A three-point calibration may be needed if the single point cannot pass – consult the instrument operating manual or manufacturer’s technical support for more information.

9.6 Verifying the Ambient Pressure

The ambient pressure verification is performed at initial sampler setup, during each site visit, and annually. The ambient pressure is displayed on the same screen beneath the filter temperature.

9.6.1 Verify that the Ambient Pressure displayed is within $\pm 10\text{mmHg}$ of the measured pressure of the transfer standard. Document these readings on form DEP 03-15-A Temperature and Pressure Verification/Calibration. If this limit is exceeded, follow steps in Section 10 of this SOP for Ambient Pressure Calibration.

Note: Form DEP 03-15-A Temperature and Pressure Verification/Calibration is used to document this verification at initial installation, annual verification, and calibration, if needed.

9.7 Perform an External Leak Check

Prior to performing the leak check, replace the sampler downtube and VSCC. Close the sampler’s top cover and latch.

9.7.1 Press the Menu button to return to the Audit and Calibration menu.

9.7.2 Scroll to Advance Filter and press [Enter]. Press right arrow to Confirm. This will advance the filter cassette (cassette containing a 47mm solid filter leak check disk) from the audit magazine into the sampling position of the sampler; this special filter must be installed in the sampling position of the sampler to ensure leak tightness.

9.7.3 Attach the flow audit adapter to the sampler downtube and close the valve on the flow audit adapter.

9.7.4 Scroll to Leak Checks and press [Enter]. Scroll to External, press [Enter] and the following message displays:

MAKE SURE THAT LEAK CHECK FILTER IS IN PLACE AND LEAK CHECK ADAPTER IS CLOSED!!!

A. Press the right arrow to begin testing. A Pass or Fail message will display at the end of the leak check cycle. The leak check pass criterion is a pressure drop of 25 mmHg or less.

If a leak check fail message is displayed on the screen, insert a filter cassette containing a new 47mm solid filter leak check disk in the topmost position of the filter cassette supply magazine and repeat the leak check procedure, or try cleaning the sample V-seals. (If leak check fails a second time, isolate the leak and repair.)

After a successful leak check, slowly open the valve on the flow audit adapter. Press the Menu button twice to return to the Audit and Calibration menu.

9.8 Perform a Flow Verification

Note: Ensure that the filter cassette used for the leak check remains in the sampling position of the sampler and the flow audit adapter is in the open position.

9.8.1 Connect flow device transfer standard to the sampler downtube. Allow the sampler flow controllers and flow device to warm-up for 15 minutes.

9.8.2 From the Audit and Calibration menu, scroll to Audit and press [Enter].

9.8.3 From the Audit screen, scroll to Flow and press the right arrow to turn on the flow, and wait for the flow to stabilize. Stabilization is attained when readings are fluctuating up and down from a central number and waiting at least 2 minutes prior to recording the value. The default sample flow should be 16.7 L/min, unless it was changed in the default settings of the Sampler. Record the flow rate from the Flow Device and the Sampler on form DEP 03-15-B Flow and Time Calibration/Verification. The sampler flow must be within $\pm 4\%$ of the transfer standard and must be within $\pm 5\%$ of the design flow (16.7 L/min). If the sampler flow limits are exceeded, follow steps in Section 10 of this SOP for Flow Calibration.

9.8.4 Press the left arrow to turn off the flow.

9.8.5 Press the Menu button to return to the Audit and Calibration menu.

9.8.6 Scroll to Audit Mode, press [Enter]. Press right arrow to Confirm (exit Audit Mode).

10.0 CALIBRATION

The following calibrations are to be performed by the agency's maintenance and support group or an experienced field technician. Documentation of the results of these calibrations will be made on the appropriate form(s) contained within the sampler log book and retained in the agency's document management system. These calibrations (which are to be performed in the following order) and their processes are discussed in the following subsections.

Note: The Service Mode must be set to ON to perform the following procedure. To turn Service Mode, on the Main Menu scroll to Service Mode and press Enter. Once in Service Mode, press Enter to toggle the Service Mode to ON. Return to the Main Menu.

10.1 Loading the Audit Magazine

Upon completing the initial sampler setup, the audit magazine can be left inside the sampler. If the audit magazine is not present at the site and a new magazine is to be setup, use Figure 9-1 as a guide.

10.2 Ambient Air Temperature Calibration

10.2.1 From the sampler's Main Menu, scroll to Audit and Calibration and press [Enter] to display the Audit and Calibration menu.

10.2.2 Remove the currently installed storage magazine from the right side of the sampler and cover with an orange storage cap. Remove the supply magazine from the left side of the filter shuttle mechanism and install on storage side. Install the audit magazine on the supply side. Ensure that the pressure supply line is connected at the bottom of the magazine.

10.2.3 The reference and sampler probe should be banded together and immersed to the same depth in an insulated constant temperature bath or block. Allow the temperature to equilibrate for at least 5 minutes prior to measuring the temperature.

10.2.4 From the Audit and Calibration menu, scroll to Advance Filter and press [Enter]. Press arrow button to Confirm.

10.2.5 Remove the supply magazine from the right side of the sampler and cover with an orange storage cap and set aside. Install the clean storage filter magazine on the right side of the sampler.

- A. Once the Advance Filter step has been completed, scroll down to Calibration and press [Enter].
- B. In the Calibration menu, scroll to Ambient Temp and press [Enter].
- C. At the Ambient Temperature Calibration screen, use the arrow buttons to enter the reference value in °C and press [Enter] to save the value. The Ambient Temperature must be within $\pm 1^{\circ}\text{C}$ of the transfer standard. The sampler automatically adjusts the corresponding offset based on this input. Document

these results on form DEP 03-15-A Temperature and Pressure Verification/Calibration.

10.3 Ambient Pressure Calibration

10.3.1 In the Calibration menu, scroll to Ambient Pres and press [Enter].

10.3.2 At the Ambient Pressure Calibration screen, use the arrow buttons to enter the reference value in mmHg and press [Enter] to save the value. The Ambient Pressure must be within ± 10 mmHg of the transfer standard. The sampler automatically adjusts the corresponding offset based on this input. Document these results on form DEP 03-15-A Temperature and Pressure Verification/Calibration.

10.4 Filter Temperature Calibration

10.4.1 In the Calibration menu, scroll to Filter Temp and press [Enter].

10.4.2 At the Filter Temperature Calibration screen, use the arrow buttons to enter the reference value in °C and press [Enter] to save the value. The Filter Temperature must be within ± 1 °C of the transfer standard. The sampler automatically adjusts the corresponding offset based on this input. Document these results on form DEP 03-15-A Temperature and Pressure Verification/Calibration.

10.5 Perform a Flow Calibration

Note: Ensure that the filter cassette used for the leak check remains in the sampling position of the sampler. Ensure that the flow audit adapter is in the open position.

10.5.1 Connect flow device transfer standard to the sampler downtube. Allow the sampler flow controllers and flow device to warm-up for 15 minutes.

10.5.2 From the Audit and Calibration screen, scroll to Calibration and press [Enter].

10.5.3 From the Calibration screen, scroll to Flow and press [Enter].

10.5.4 With the cursor on Start Calibration, press [Enter] and wait for the flow to stabilize. Stabilization is attained when readings are fluctuating up and down from a central number and waiting at least 2 minutes prior to recording the value. Under the Setpoint 1 (15.003), the sampler flow is the “live” reading and the transfer standard

valued will be entered as the “actual” reading. Record the flow rate from the flow device and the sampler on form DEP 03-15-B Flow and Time Calibration/Verification.

10.5.5 Enter the transfer standard flow reading in the sampler and press [Enter]. The screen will automatically move to Setpoint 2.

10.5.6 Record the flow rate from the flow device and the sampler for Setpoint 2 (16.67) on form DEP 03-15-B Flow and Time Calibration/Verification.

10.5.7 Enter the transfer standard flow reading in the sampler and press [Enter]. The screen will automatically move to Setpoint 3.

10.5.8 Record the flow rate from the flow device and the sampler for Setpoint 3 (18.337) on form DEP 03-15-B Flow and Time Calibration/Verification.

10.5.9 Enter the transfer standard flow reading in the sampler and press [Enter]. The screen will automatically move to display the new slope and intercept adjusted by the sampler. Record these values on form DEP 03-15-B Flow and Time Calibration/Verification.

Note: The sampler flow and measured flow of the transfer standard must be within $\pm 5\%$ of the design flow (16.7 L/min).

10.5.10 Press the Main Menu button until Service Mode can be turned off and Audit Mode is turned on.

10.5.11 Scroll to Audit and press [Enter].

10.5.12 Scroll to Flow and press the right arrow button to turn on the flow and confirm the flow following the calibration.

10.5.13 Press the left arrow to turn off the flow. Press the menu button to return to the Audit and Calibration screen. Scroll to Audit Mode, press [Enter], and exit Audit Mode.

10.6 Perform an External Leak Check

Note: Prior to performing the leak check, replace the 1st stage inlet, the sampler downtube, and VSCC. Close the sampler's top cover and latch.

10.6.1 Press the Menu button to return to the Audit and Calibration menu.

10.6.2 Scroll to Advance Filter and press Enter. This will advance the filter cassette (cassette containing a 47mm solid filter leak check disk) from the audit magazine into the sampling position of the sampler; this filter must be installed in the sampling position of the sampler to ensure leak tightness. Attach the flow audit adapter to the sampler downtube and close the valve on the flow audit adapter.

10.6.3 Scroll to Leak Checks and press Enter. Scroll to External, press Enter and the following message displays:

MAKE SURE THAT LEAK CHECK FILTER IS IN PLACE AND LEAK CHECK ADAPTER IS CLOSED!!!

10.6.4 Press the right arrow to begin testing. A Pass or Fail message will display at the end of the leak check cycle. The leak check pass criterion is a pressure drop of 25 mmHg or less.

If a leak check fail message is displayed on the screen, insert a filter cassette containing a new 47mm leak check filter in the topmost position of the filter cassette supply magazine and repeat the leak check procedure, or try cleaning the sample V-seals. (If leak check fails a second time, isolate the leak and repair.)

10.6.5 After a successful leak check, slowly open the valve on the flow audit adapter, remove the adapter, and then press the Menu button to return to Audit and Calibration screen.

11.0 INSTRUMENT MAINTENANCE

Routine maintenance is performed according to Table 11-1. During each maintenance session, enter the date the maintenance procedure was performed and initial underneath the date on form DEP 03-15-E Semi-Annual/Annual Maintenance Record. External leak check is to be performed upon site arrival, prior to every flow verification/calibration, after maintenance, and prior to returning to ambient sampling. Air screens must be checked every 6 months for cleanliness.

Table 11-1. Routine Maintenance Schedule

CHECKS/MAINTENANCE	FREQUENCY
PM ₁₀ inlet change or cleaning	Every 14 days if sampling daily Minimum monthly
VSCC change or cleaning	Monthly (30 days)
Particle trap filter change	Every 6 months
Clean air screens	Every 6 months

Note: Operators are required to use independent device(s) during audits.

11.1 First Stage PM₁₀ Inlet Change

The inlet is removed by gently lifting the complete inlet upward off the 1-1/4" OD sampler downtube. A spare inlet is maintained which is installed and the maintenance of the "dirty" inlet is performed in the agency maintenance facility or in the field if a spare, clean inlet is not available.

11.2 First Stage PM₁₀ Inlet Cleaning

Recommended supplies and tools include:

- Ammonia-based, general purpose cleaner
- Cotton swabs
- Small soft bristle brush
- Paper towels
- Distilled water
- Silicone-based stopcock grease
- Small screwdriver
- Small crescent wrench

- Pocket knife

11.3 Removing and Disassembling the Inlet

11.3.1 Unlatch and open the top cover of the sampler with the sampler downtube and first stage inlet.

11.3.2 Lift the entire inlet assembly upward off the 1-1/4" OD sampler downtube.

11.3.3 Disassemble the upper and lower inlet halves by unscrewing, counterclockwise, the top acceleration assembly from the lower collector assembly.

11.4 Clean and Maintain the Top Acceleration Assembly

11.4.1 Mark the top plate deflector cone and lower plate with a pencil scribe to facilitate proper orientation when reassembling the assembly after cleaning and maintenance.

11.4.2 Using a Phillips-blade screwdriver, remove the four pan head screws from the top of the top plate. Lift the top plate off the four, threaded, spacer standoffs and set aside.

11.4.3 Inspect the insect screen for contamination. Clean the screen by lifting it off the lower plate rain deflector and brushing or rinsing it with water until it is clean. Dry and reinstall.

11.4.4 Using a general-purpose cleaner and paper towel, clean the top plate deflector cone and internal wall surface of the acceleration assembly.

Note: Be sure that after cleaning the assembly the acceleration nozzle is clean. If not, use a cotton swab and cleaner to remove any contamination.

11.4.5 Inspect the large diameter, impactor nozzle O-ring for damage or wear. Replace it, if necessary. If the O-ring is still in good condition, apply a thin film of silicone grease to the O-ring. Also, apply a light coating of silicone grease to the aluminum threads of the acceleration assembly.

11.4.6 After reinstalling the bug screen, align the top plate markings with the lower plate markings. The four holes in the top plate should align with the four spacer standoffs. Insert the top plate into the lower plate and tighten the four pan-head screws.

11.5 Clean and Maintain the Lower Collector Assembly

Note: Most of the contamination in the inlet is usually found on the collector plate.

11.5.1 Using a general-purpose cleaner with a paper towel, clean the collector assembly walls and three vent tubes. You may need to use a cotton swab to clean these vent tubes. Also, clean the bottom side of the collector assembly.

11.5.2 Using a cotton swab, clean the weep hole in the collector plate where the moisture runs out to the moisture trap. Remove the rain jar and clean it. Inspect the rain jar's brass nipple fitting to ensure that it is secure and free from blockages. When

reinstalling the rain jar, place a light coating of silicone grease on the gasket inside the cap of the rain jar. This will ensure a leak-free fit.

11.5.3 Inspect the two inlet-to-inlet, tube sealing O-rings for damage or wear. Replace, if necessary. Apply a light coating of silicone grease to these O-rings to ensure that a seal is made when they are reinstalled on the 1-1/4" OD sampler downtube.

11.5.4 Clean the lower collector assembly's threads to ensure a tight seal when the two halves are reassembled.

11.6 Re-assemble and Re-install the PM₁₀ Inlet

11.6.1 Reassemble the top and bottom inlet assemblies until the threads tighten. Hand-tight only.

11.6.2 Replace the inlet on the 1-1/4" OD sampler downtube. Take care not to damage the internal O-rings.

11.7 Cleaning the BGI VSCC®

Clean using mineral-free water and lint-free lab wipes. In cases where stubborn deposits are observed, ultrasonic cleaning in soap and water is recommended, but not required by the manufacturer.

11.7.1 Disassembling and Cleaning a BGI VSCC®

- A. Pull off the side transfer tube. If it is too tight to remove by hand, pry it off with a rigid plastic lever. Care should be taken to not damage the two "O" ring seals.
- B. Remove the top cap and grit pot by unscrewing.
- C. Wet a lint-free wipe with water and remove all visible deposits. These are most likely to be found at the bottom of the cone and inside the grit pot.
- D. Inspect all "O" rings for shape and integrity. If at all suspect, replace. Lubricate all "O" rings with silicone-based stopcock grease. It is important to completely lightly lubricate the transfer tube to avoid difficult disassembly.
- E. Assemble in reverse order.

11.8 Cleaning the "V" Seals

11.8.1 Perform the following steps to check the "V" seals:

- A. Ensure the instrument is not sampling and is in STOP Mode.
- B. Unlatch and open the top cover of the Partisol-Plus Sampler with the sampler downtube and first-stage inlet attached to gain access to the particle size separator.
- C. Locate and remove the particle size separator from the upper part of the sampler enclosure.

- D. Remove the exit cylinder cover (held in place with two screws) and the electronics cover (held in place with two screws) from the top of enclosure.
- E. Remove the side cover of the electronics compartment by removing the four small screws accessible from the main compartment.
- F. Locate the top head mounting plate and remove the four screws holding it in place.
- G. Move the plate (with the top head attached) to the side to expose the V-seals in the filter exchange mechanism.
- H. Locate the two “V” Seals now exposed. The lower V-seal is in the filter exchange mechanism. The top seal is located in the top head. The bottom seal is located in the now exposed section of the filter exchange assembly. Examine both seals for drying and/or cracking. Replace, if necessary.

Note: Bottom “V” Seal: R&P Part number 23-002182; Top “V” Seal: R&P Part Number 23-004276

- I. Locate the sampler downtube mount on the top cover and locate the downtube mount “V” seal. Examine seal for drying and/or cracking. Replace, if necessary.

Note: Downtube mount “V” Seal: R&P Part number 23-004576

- J. Replace the top head mounting plate and secure using the four screws.
- K. Install the side cover, top cover and exit cylinder cover.
- L. Replace the particle size separator and close the top cover.
- M. Perform a leak check using steps in Section 10.6 of this SOP.
- N. Resume normal operation.

11.9 Particle Trap Filter Change

The particle trap filter is located behind the filter shuttle mechanism and protects the samplers flow controllers from particulate matter in the flow controller lines. Use the following procedure to exchange the particle trap filter.

- 11.9.1 Turn the sampler off and locate the bowl-style filter behind the filter shuttle assembly.
- 11.9.2 Remove the filter bowl from the filter manifold.
- 11.9.3 Carefully remove the filter stand by unscrewing from the filter. *Note: The O-ring usually remains in the filter manifold.*
- 11.9.4 Remove the gasket and top disk from the filter stand. Note: Sometimes the gasket remains inside the filter manifold.
- 11.9.5 Remove the filter element from the filter stand and install a new element.
- 11.9.6 Install the top disk and gasket (if necessary) into the filter stand.
- 11.9.7 Install the filter stand into the filter manifold and install the O-ring into the filter manifold (if necessary).
- 11.9.8 Install the filter bowl into the filter manifold.
- 11.9.9 Turn on the sampler and perform an external leak check.
- 11.9.10 Perform a post external leak check following any maintenance using steps 10.6.1 thru 10.6.5.

12.0 QUALITY ASSURANCE/CONTROL AND OPERATIONS

Quality assurance is a system of management and operational activities designed to ensure that the data produced by the operation of the sampler will be of the type and quality needed and expected by the data user. Quality control defines the procedures implemented to assure that acceptable precision, bias, completeness, representativeness, and comparability are obtained and maintained in the generated data set. Quality control procedures, when properly executed, provide data that meet or exceed the minimally acceptable quality criteria established to assist management in making confident decisions. It is the policy of the Florida PQAO to implement a QA program and QC procedures to assure that data of known and acceptable precision, bias, completeness, comparability, and representativeness are collected from all monitoring projects. The following procedures and their associated intervals are used to manage the quality of data generated by the sampler. When performing annual verifications and/or calibrations, independent device(s), not used for routine checks, are required to be used.

Figure 12-1. Sample Run Limits

SAMPLE RUN LIMITS	
Turn ON Time	00:00 ± 30 Minutes
Sample Time (Critical)	24:00 Hours ± 1 Hour (i.e. 1440 Minutes ± 60 Minutes) * Pick up within 177 hours of end of run
Flow Rate (Critical)	16.67 ± 5% (Flow May Exceed 5% if less than 5 Minutes)
Sample Pick-up (Critical)	Within 7 days 9 hours from sample end date
Flow Rate Variability (Critical)	24 hour CV <2%
FIELD CHECK LIMITS	
Flow Rate (Critical)	16.00 to 17.34 l/min, within 4% of Standard, within 5% of Design Flow
Ambient Temperature Probe	±2° C of Temperature Transfer Standard
Filter Temperature Probe	±5° C of Ambient Temperature Probe
Pressure Sensor	± 10 mmHg of Transfer Standard
CALIBRATION LIMITS	
Time	± 1 Minute of the Time Standard
Flow Rate	16.67 l/min ± 2% of Flow Standard
Ambient Temperature Probe	± 1° C OF Temperature Transfer Standard
Filter Temperature Probe	± 1° C of Temperature Transfer Standard
Pressure Sensor	±10 mmHg of Transfer Standard

12.1 PRE-SITE VISIT PREPARATIONS

Perform a one-point check for ambient temperature, filter temperature, ambient pressure, and flow check every site visit and document on form DEP 03-15-H Site Visit Form.

12.1.1 Receipts from the Laboratory

The only filter media currently approved by the U.S. EPA for reference method sampling of PM_{2.5} is 2µm pore -size Teflon® material in a 47 mm diameter size. The unexposed, pre-weighed filters will be received from the processing laboratory preloaded in capped magazines ready for sampling. **Handling the individual filters will void the sample and should be avoided.**

Complete the following entries on form DEP 03-15-D FILTER LOG accordingly:

- A. The date the filters were received from the laboratory
- B. The magazine number
- C. The filter number
- D. Place your initials beside the filter # block in the “Operator In” box

12.2 Storage

Filter cassettes (pre-loaded in magazines) should be stored in a secure, dry, and controlled environment. There are no control limits on humidity or temperature for storage environment on unexposed filters. It is important to maintain a chain of custody for the filters.

12.3 Pre-Sampling Preparation

The lab will provide a list of the filter numbers, in sampling sequence, contained in each magazine to update the form DEP 03-15-D FILTER LOG and also to prepare the preliminary data on the sampler run data sheet (form DEP 03-15-F PM_{2.5} SAMPLER RUN DATA SHEET or form DEP 03-15-G PM_{2.5} SAMPLER RUN DATA SHEET (for Multiple Filters)) for each filter.

12.4 PM_{2.5} Filter Custody Log, Form DEP 03-15-I

The PM Filter Custody Log, will be issued from the laboratory electronically.

12.4.1 On receiving form DEP 03-15-I PM FILTER CUSTODY LOG, make sure that the indicated magazine numbers were actually received.

12.4.2 If there is a discrepancy in the magazine numbers or the number of magazines received, notify the laboratory personnel immediately.

12.4.3 If the indicated number of magazines and the magazine numbers received were correct, write down the date those magazines and filters were received and sign on the form DEP 03-15-I PM FILTER CUSTODY LOG.

12.4.4 Retain a copy for your agency's records of the signed form appropriately.

12.4.5 Complete the form DEP 03-15-I PM FILTER CUSTODY LOG, and return it electronically to the laboratory personnel within 48 hours. The signed electronic form is a password protected EXCEL file that will maintain the original data and any updated information or retained as a pdf. It is part of the record and must be retained in the agency's data management system.

12.4.6 Take note of the expiration date of the filters received and work toward using these filters before they expire.

12.5 Transport to the Sampler

Magazines should be transported to the sampler in a lab issued soft side cooler to prevent damage to the magazines.

12.6 Filter Collection

12.6.1 On form DEP 03-15-F PM2.5 SAMPLER RUN DATA SHEET, complete the information for the filters in the storage magazine.

Note: Recording the information on the form is preferred. The F file records this information but may be lost. To prevent data loss please record "MIN", "AVG" and "MAX" values for ambient temperature and pressure, "SUPPLY MAG", "STORAGE MAG", "MAX TEMP", "TIME", "DATE", "ON ARRIVAL STATUS", "MODE" and "POWER FAILURES".

12.6.2 When running multiple filters, use form DEP 03-15-G PM2.5 SAMPLER RUN DATA SHEET (for Multiple Filters). Record the initial temperature, pressure and flow, and when done retrieving the filters, record the final temperature, pressure and flow values. Recording these values will protect the ability to have a valid run, should the F file fail. The initial/final temperature, pressure and flow values should be within the specifications on the form.

12.6.3 Remove the air supply hose then remove the empty supply filter magazine from the left side of the sampler and install an audit magazine, see Figure 9-1, and attach the air pressure hose. If the sampler has completed sampling for the filter in the sampling chamber, advance the filter cassette from the audit magazine to move the last sampling filter to the storage magazine for transport.

Note: When using the audit magazine during routine QC checks, the audit magazine should have the filter cassette on the top and the empty cassette on the bottom.

12.6.4 Remove the filter magazine containing the sample filters from the storage position on the right side of the sampler. Cap the magazine and place it in the transport cooler. Record the removal time on Form DEP 03-15-D Filter Log. Install the new supply magazine in the storage position.

12.6.5 The final conditions for the filters that are being collected are recorded on form DEP 03-15-F PM2.5 SAMPLER RUN DATA SHEET or form DEP 03-15-G PM2.5 SAMPLER RUN DATA SHEET (for Multiple Filters). Indicate whether or not (Yes or No) the ambient temperature was within ± 2 degrees of the transfer standard, ambient pressure was within 10 mm Hg of the transfer standard, and if the flow rate was between 16.00 and 17.34 l/min. These conditions are also Initial Conditions for the filters that will be set up to run.

12.6.6 The operator must initial and date form DEP 03-15-F PM2.5 SAMPLER RUN DATA SHEET or form DEP 03-15-G PM2.5 SAMPLER RUN DATA SHEET (for Multiple Filters).

12.6.7 Enter Audit mode and advance the Leak check filter. This will advance the filter cassette (cassette containing a 47mm filter) from the audit magazine into the sampling position of the sampler; this filter must be installed in the sampling position of the sampler to ensure leak tightness.

- A. From the sampler's Main Menu (press the Menu button to display), scroll (using the arrow buttons) to Audit and Calibration and press [Enter].
- B. With the cursor at Audit Mode, under the Audit and Calibration menu, press [Enter]. Press right arrow to Confirm.
- C. Once in Audit Mode, scroll to Advance Filter and press [Enter]. Press right arrow to Confirm.
- D. Follow steps 9.7.3 thru 9.7.4 to perform the leak check. Document the final result on form DEP 03-15-H Site Visit Form.

12.6.8 Once the Advance Filter step has been completed, scroll down to Audit and press [Enter]. This will display the temperatures and pressures of the sampler.

12.7 Verify the Ambient Air Temperature

12.7.1 Perform a one-point ambient temperature verification. Verify that the Ambient Temperature displayed is within $\pm 2^{\circ}\text{C}$ of the measured temperature of the transfer standard. Document the readings on form DEP 03-15-H Site Visit Form. If this limit is exceeded, follow steps in Section 10 of this SOP for Ambient Air Temperature Calibration.

12.8 Verify the Filter Temperature

12.8.1 Perform a one-point filter temperature verification. Verify that the Filter Temperature displayed is within $\pm 2^{\circ}\text{C}$ of the measured temperature of the transfer standard and $\pm 5^{\circ}\text{C}$ of the ambient temperature. Document these readings on form DEP

03-15-H Site Visit Form. If this limit is exceeded, follow steps in Section 10 of this SOP for Filter Temperature Calibration.

12.9 Verify the Ambient Pressure

12.9.1 Verify that the Ambient Pressure displayed is within ± 10 mmHg of the measured pressure of the transfer standard. Document these readings on form DEP 03-15-H Site Visit Form. If this limit is exceeded, follow steps in Section 10 of this SOP for Ambient Pressure Calibration.

12.10 Verify the Flow

Note: Ensure that the filter cassette used for the leak check remains in the sampling position of the sampler and the flow audit adapter is in the open position.

12.10.1 Connect flow device transfer standard to the sampler downtube. Allow the sampler flow controllers and flow device to equilibrate to ambient.

12.10.2 From the Audit and Calibration menu, scroll to Audit and press [Enter].

12.10.3 From the Audit screen, scroll to Flow and press the right arrow to turn on the flow, and wait for the flow to stabilize. Stabilization is attained when readings are fluctuating up and down from a central number and waiting at least 2 minutes prior to recording the value. The default sample flow should be 16.7 L/min, unless it was changed in the default settings of the Sampler. Record the flow rate from the Flow Device and the Sampler on form DEP 03-15-B Flow and Time Calibration/Verification. The sampler flow must be within $\pm 4\%$ of the transfer standard and must be within $\pm 5\%$ of the design

flow (16.7 L/min). If the sampler flow limits are exceeded, follow steps in Section 10 of this SOP for Flow Calibration.

12.10.4 Press the left arrow to turn off the flow.

12.10.5 Remove the audit magazine from the left side of the sampler and install in the right side of the sampler.

12.10.6 Remove the new, unexposed supply magazine from the right side of the sampler and install in the left side of the sampler.

12.10.7 Advance the audit magazine leak check filter (filter cassette) out of the sampling chamber. This will return the filter that was originally advanced back to the sampling chamber.

12.10.8 Remove the audit magazine from the right side of the sampler and store in rear of sampler.

12.10.9 Install the empty magazine that was set aside upon arrival to site in the right side of the sampler.

12.10.10 Press the Menu button to return to the Audit and Calibration menu.

12.10.11 Scroll to Audit Mode, press [Enter]. Press right arrow to Confirm (exit Audit Mode).

Note: When performing this verification during each site visit, following the Flow Verification on a daily sampler, once Audit Mode has been exited, the sampler will return to Sampling Mode.

12.11 Filter Installation

12.11.1 Magazine Installation for Daily Sampling

- A. The supply magazine received from the laboratory is installed on the left side (supply position) of the sampler, while a clean, empty storage magazine is installed on the right side (storage position).
- B. From the Main Screen, press the Run button to put sampler in Stop Mode. Press the right arrow button to Confirm.
- C. Press the Menu button to display the Main Menu.
- D. Scroll to Sample Setup and press [Enter].
- E. With the cursor on Apply EPA Times, press [Enter]. Press the right arrow to set EPA times. This will set the sampler to run midnight to midnight, 24-hour continuous sampling.
- F. From the Sample Setup screen, scroll to Sample01. Ensure that the start and stop times are midnight to midnight (00:00) and the duration displays 24h 00m.

- G. If the sample is to be programmed as a blank, scroll to Filter Blank and press [Enter]. Press [Enter] to toggle to Yes or No. Press the Menu button to return to the Sample 1 menu.
- H. Scroll to Filter ID and press [Enter]. Use the arrow buttons as indicated on the screen to set the Filter ID and press [Enter] to save. Press the Menu button to return to the Sample 1 menu.
- I. Scroll to Cassette ID and press [Enter]. Use the arrow buttons as indicated on the screen to set the Cassette ID and press [Enter] to save. Press the Menu button to return to the Sample 1 menu.
- J. Scroll to Filter Type and press [Enter]. Use arrow buttons to change value and press [Enter] to save. Press the Menu button twice to return to Sample Setup.
- K. Use steps F thru J above for each sample setup.
- L. Once samples are set up, press the Run button to return to Wait or Sampling Mode.

12.11.2 Filter Installation for 3, 6, or 12-day Sampling

- A. From the Main Screen, press the Run button to put sampler in Stop Mode. Press the right arrow button to Confirm.
- B. Press the Menu button to display the Main Menu.
- C. Scroll to Instrument Setup and press [Enter].
- D. Scroll to Default Sample Times and press [Enter].
- E. Scroll to Repeat Time and press [Enter]. Use the arrow buttons as indicated on the screen to set the Repeat time. Times are set to 72h 00m for 3-day, 144h 00m for 6-day, and 288h 00m for 12-day sampling.
- F. Press Menu button three times to return to the Main menu.
- G. Scroll to Sample Setup and press [Enter].
- H. Follow steps F thru J in Section 12.6.1 above for each sample setup.
- I. Once samples are set up, press the Run button to return to Wait or Sampling Mode.

12.12 Transport from the Sampler

The soft side cooler containing the exposed filters in a magazine should be transported back to the agency storage facility. The container must be capable of keeping the filters as cool as practical and prevent exposure to temperatures exceeding 25° C. A soft side cooler loaded with “blue ice”, or equivalent, and transported in an air-conditioned vehicle will allow cooling to begin during transport.

12.13 Post-Sampling Storage

Each agency will have a refrigerator capable of maintaining a compartment temperature of $< 4^{\circ}\text{C}$. A resettable max/min thermometer will monitor the temperature. When the sample filters are returned to the agency, reset the max/min thermometer and place the magazine with exposed filters in the refrigerator. The resettable max/min thermometer will verify the temperature capability quarterly and the results will be recorded on form DEP 03-15-C Refrigerator Log Form at least once per quarter. If the refrigerator is not within the limits, record temperatures with each batch of magazines until the refrigerator is repaired or replaced to meet the limits. Verify that the temperature is below 25°C and below the lowest ambient average temperature at which a batch of filters were sampled. If not, verify that the filters were in conditioning within 10 days or invalidate the impacted filters. Also record your initials in the date block.

13.0 DATA ACQUISITION AND RECORDS MANAGEMENT

13.1 Data Acquisition

Data acquisition is accomplished using either RPComm, via direct connection or modem, or iPort, via Ethernet connection. The Partisol 2025i Sequential Air Sampler Manual, Appendix D describes the installation and use of these two programs. During the download, three types of files are collected: the filter file (“F-File”) which shows filter information, the interval file (“I-File”) which shows 5-minute interval data, and the input file (“P-File”) which shows 30-minute interval data. The data, once collected, is verified and uploaded into PMTS where it is further verified. This process is detailed in the Florida Statewide Data Handling and Data Validation SOP.

13.2 Records Management

Records Management is the process to manage, store, back-up, and protect all the documents associated with the operation, quality assurance, and the data associated with the TEI 2025i particulate matter sampler. All records must be backed up, stored securely and retained for a minimum of 5 years. State law dictates retention schedules for various records. Refer to the specific SOPs that delineate the process, including DEP 18-27 Data Handling and Data Validation.

14.0 REFERENCES

- A. Quality Assurance Project Plan for the State of Florida Ambient Air Particulate Matter 2.5 Monitoring Program, FDEP QAPP-001A, Revision 3, May 2012, Florida Department of Environmental Protection, Tallahassee, FL.
- B. Quality Assurance Guidance Document 2.12 “Monitoring PM_{2.5} in Ambient Air Using Designated Reference or Class I Equivalent Methods”, EPA-454/B-16-001, January 2016, Environmental Protection Agency.
- C. Partisol 2025i Sequential Air Sampler/Partisol 2025i-D Dichotomous Sequential Air Sampler Instruction Manual, Part Number 110100-00, April 2015.
- D. Standard Operating Procedure for Data Handling and Data Validation, DEP 18-27, Revision No. 2, May 2017, Florida Department of Environmental Protection, Tallahassee, FL.
- E. 40 CFR § 50 2017
- F. 40 CFR § 53 2017
- G. 40 CFR § 58 2017

15.0 APPENDICIES

15.1 Appendix A - Forms

15.1.1 DEP 03-15-A 2025/2025i Temperature and Pressure Verification/Calibration Form

Form No. DEP 03-15-A		2025/2025i TEMPERATURE AND PRESSURE VERIFICATION/CALIBRATION FORM				Effective on: xx/xx/xxxx
Identification Block						
Date Performed:		Site Name:		AQS #:		Procedure: Verification/Calibration
Instrument Mfr:		Model:		Serial #/ID #:		Date Calibrated:
						Select Frequency: Annual
Standards Block						
Reference Thermometer Mfr:		Model:		Serial #/ID #:		Date Certified:
Barometric Transfer Standard Mfr:		Model:		Serial #/ID #:		Date Certified:
Ambient Temp Probe						
Probe Verification	Reference Standard	Ambient Probe	Difference*	Limit	RESULT	
Ambient Probe Temp (°C)			n/a	± 1 °C	n/a	
Cold Water Temp (°C)			*Adjustments determined by Ambient Temp Difference Only			
Hot Water Temp (°C)						
Probe Calibration (Single Point)	Reference Standard	Ambient Probe	Difference	Limit	RESULT	
Unadjusted Ambient Probe Temp (°C)			n/a	± 1 °C	n/a	
Unadjusted Ambient Offset	n/a		n/a	n/a	n/a	
Adjusted Ambient Probe Temp (°C)			n/a	± 1 °C	n/a	
Adjusted Ambient Offset	n/a		n/a	n/a	n/a	
Filter Temp Probe						
Probe Verification	Reference Standard	Filter Probe	Difference*	Limit	RESULT	
Ambient Filter Probe Temp (°C)			n/a	± 1 °C	n/a	
Cold Water Temp (°C)			*Adjustments determined by Ambient Temp Difference Only			
Hot Water Temp (°C)						
Probe Calibration (Single Point)	Reference Standard	Filter Probe	Difference	Limit	RESULT	
Unadjusted Filter Probe Temp (°C)			n/a	± 1 °C	n/a	
Unadjusted Filter Offset	n/a		n/a	n/a	n/a	
Adjusted Filter Probe Temp (°C)			n/a	± 1 °C	n/a	
Adjusted Filter Offset	n/a		n/a	n/a	n/a	
Pressure Sensor						
Sensor Verification	Barometric Transfer Standard	Ambient Sensor	Difference*	Limit	RESULT	
Ambient Pressure (mmHg)			n/a	+/- 10 mmHg	n/a	
Sensor Calibration (Single Point)	Barometric Transfer Standard	Ambient Sensor	Difference	Limit	RESULT	
Unadjusted Amb Pressure (mmHg)			n/a	+/- 10 mmHg	n/a	
Adjusted Amb Pressure (mmHg)	n/a		n/a	n/a	n/a	
Operator Comments:						
Performed by:		Date:				
QA Comments:						
Verified by:		Date:				

Instructions to complete Form DEP 03-15-A

1. Procedure... Select performed procedure from drop down menu
2. Instrument Mfr... instrument manufacturer
3. Model... instrument's model
4. Serial #/ID #... instrument's ID number
5. Date Calibrated...instrument's last calibration date
6. Select frequency... frequency for selected procedure
7. Ambient Temp Probe...composed of 3 points: ambient temperature, cold water, and hot water. Only the ambient temperature point can be adjusted. Reference temperatures are taken with a reference thermometer and unadjusted/adjusted values are obtained from the 2025i instrument
8. Filter Temp Probe... composed of 3 points: ambient temperature, cold water, and hot water. Only the ambient temperature point can be adjusted. Reference temperatures are taken with a reference thermometer and unadjusted/adjusted values are obtained from the 2025i instrument
9. Pressure Sensor...composed of one point at ambient pressure. Reference value is taken with a reference barometer and unadjusted/adjusted values are obtained from the 2025i instrument
10. Operator... technician who performs calibration and/or verification

15.1.2 DEP 03-15-B 2025/2025i Flow and Time Calibration/Verification

Form No. DEP 03-15-B	2025/2025i Flow and Time Calibration/Verification				Effective on: xx/xx/xxxx		
Identification Block							
Date Performed:	Site Name:		AQS #:		Procedure: Calibration		
Instrument Mfr:	Model:		Serial #:		Date Calibrated:		
VSCC Mfr:			Serial #:				
Standards Block							
Flow Transfer Standard Mfg:	Model:		Serial #:		Date Certified:		
Time Standard Mfg:	Model:		Serial #:		Date Certified:		
Orifice Mfg:	Model:		Serial #:		Date Certified:		
Flow Calibration							
External Leak Check	Instrument	Limit	Result				
Leak Rate (mmHg/min)		≤ 25 mmHg/min					
Flow Rate Calibration							
As Found Instrument Slope		As Found Instrument Intercept	Orifice (FTS) Slope		Orifice (FTS) Intercept		
Set Point/Audit Level	Instrument Flow (LPM)	TS (IN. H ₂ O)	TS Actual Flow (LPM)	% Difference	Limit	RESULT	
Set Point 1 - 16.670	n/a			#VALUE!	n/a	n/a	
Set Point 2 - 15.003				#DIV/0!	± 2 %	n/a	
Set Point 3 - 18.337				#DIV/0!	± 2 %	n/a	
Audit - 16.67				#DIV/0!	± 2 %		
NEW Instrument Slope		NEW Instrument Intercept					
Time Calibration							
	Instrument	Ref. Std.	Difference	Limits	RESULT		
As Found Time				± 1 minute			
Post Calibration Time				± 1 minute			
Operator Comments:							
Performed by:		Date:					
QA Comments:							
Verified by:		Date:					

Instructions to complete DEP 03-15-B

B. For the ID block, provide information for the following:

1. Procedure... Select performed procedure from drop down menu
2. Instrument Mfr... instrument manufacturer
3. Model... instrument's model
4. Serial #... instrument's ID number
5. Date Calibrated...instrument's last calibration date
6. VSCC Mfr... VSCC manufacturer

C. For the Standards block, provide information for the following:

1. Flow rate transfer standard mfr...the manufacturer of the flow transfer standard
2. Time Standard. mfr...refers to the manufacturer's name of the primary/transfer standard used or being used to calibrate the PM2.5 model 2025 time system
3. Orifice mfr...the manufacturer of the orifice
4. Model... instrument's model
5. Serial #... instrument's ID number
6. Date Calibrated...instrument's last calibration date

D. For the external leak check, provide information for the following:

1. Leak rate (mmHg/min)

E. For the flow verification/calibration, provide information for the following:

1. The slope and intercept of the flow transfer standard before and after its calibration
2. The FTS (the flow transfer standard) flow responses when the PM2.5 model 2025 is preset at 15.0 l/min, 16.7 l/min and 18.4 l/min respectively
3. The actual flow responses of the PM2.5 model 2025 when it is preset at 15.0 l/min, 16.7 l/min and 18.4 l/min respectively
4. Percentage difference...refers to the percentage differences between the FTS and that registered by the PM2.5 model 2025 at the preset values just indicated above. The percentage difference must be within $\pm 2\%$
5. The new offset and the new span value
6. For the time system verification/calibration, provide information for the following:
7. Sampler unadjusted time...refers to the PM2.5 model 2025 unadjusted time (pre-calibration)
8. Sampler adjusted time...refers to the PM2.5 model 2025 adjusted time (post-calibration)
9. Operator's initial
10. Date...refers to the date when the PM2.5 model 2025 time system calibration was performed
11. Verified by...requires the initial of the supervisor who verified the entry.

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Instructions to complete DEP 03-15-C

12. Date... record date of refrigerator check
13. Operator... record name of individual checking the refrigerator temperature
14. Time...record time of check
15. Filters stored...place check when filters are placed in refrigerator
16. Filters removed...place check when filters are removed from refrigerator
17. Min Temp... record minimum temperature
18. Max Temp... record maximum temperature
19. Cert Date...record certification date for min/max thermometer
20. Serial Number... record serial number for min/max thermometer

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Instructions to complete DEP 03-15-D

F. For the Incoming filter, provide the following information:

1. Rec. Date ... the date the filters were received from the weighing lab
2. Mag # ... the identification number of the magazine which contained the filters
3. Filt. # ... the weighing laboratory-assigned filter numbers
4. Oper In ... the initials of the personnel who received the filters from the weighing lab

G. For the Filter Run Data, provide the following information:

1. Start Date ... the date the run started or will start
2. Start Time ... the time the run started or will start
3. Stop Date ... the date the run stopped or will stop
4. Stop Time ... the time the run stopped or will stop

H. For the Filter Storage Data, provide the following information:

1. Date...the date the filter was placed in the refrigerator
2. Time...the time the filter was placed in the refrigerator
3. Frozen Blue Ice Yes/No... enter Yes if samples were transported cold. Enter No if samples were not transported cold
4. Oper In ... the initials of the personnel who retrieved the filter and placed it in the refrigerator (last column)

Note: Refrigerator Temp must be recorded annually and confirmed as operating properly.

I. For the Outgoing filter, provide the following information:

1. Ship Date ... the date the filter was shipped to the weighing laboratory
2. Mag # ... the magazine number in which the filters were shipped
3. Lab Filter Comments ... indicate either "Field Blank" or "Void" where applicable, otherwise, no entry is required
4. Oper Out ... initials of the personnel who shipped out the filter
5. Completed By and QA/QC By ... Electronic operator's and a supervisor's initials with their respective dates, are required
6. Write any other comments in the bottom lines, e.g. the filter # and any unusual event.

15.1.5 DEP 03-15-E 2025/2025i Semi-Annual/Annual Maintenance Form

Form No. DEP 03-15-E		2025/2025i SEMI-ANNUAL/ANNUAL MAINTENANCE RECORD											
Identification Block													
Date Performed:	Site Name:	AQS #:	Parameter										
Instrument Mfr:	Model:	Serial #:	Date Calibrated:										
YEAR:		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SEMIANNUAL:													
PARTICLE TRAP CHG													
CLEAN AIR SCREENS (FOUR)													
ANNUAL CALIBRATIONS:													
AMBIENT TEMP. PROBE													
FILTER TEMP. PROBE													
AMBIENT PRESS. SENSOR													
FLOW RATE SYSTEM													
SAMPLER TIME SYSTEM													
OPERATOR'S INITIALS													
COMMENTS:													
VERIFIED BY:								DATE:					

Instructions to complete DEP 03-15-E

7. Instrument Mfr... instrument manufacturer
8. Model... instrument's model
9. Serial #... instrument's ID number
10. Date Calibrated...instrument's last calibration date
11. Parameter... select either PM2.5 or PM10
12. Months... write the date each maintenance was completed underneath their respective months

15.1.6 DEP 03-15-F Sample Run Data Sheet



Florida Department of Environmental Protection

DEP 03-15
REV. No. 0: May 2016
Effective: 07-05-2016

FORM DEP 03-15-F PM2.5 SAMPLER RUN DATA SHEET

SITE NAME:		AQS#:	
SAMPLER MFR:		MODEL#:	
VSCC #:		S/N:	
FILTER ID:			
START DATE/TIME:	/ LST	VOID:	
STOP DATE/TIME:	/ LST	BLANK FILTER:	
VALID ELAPSED TIME:	HOUR:MIN		

INITIAL CONDITIONS

DID THE SAMPLER PASS THE:	AMBIENT TEMPERATURE CHECK ($\pm 5^{\circ}\text{C}$)?	
	AMBIENT PRESSURE CHECK (± 10 mmHg of the transfer standard)?	
	AVERAGE FLOW RATE (16.0 TO 17.34 l/min)?	
OPERATOR'S INITIALS:		DATE:

FINAL CONDITIONS

DID THE SAMPLER PASS THE:	AMBIENT TEMPERATURE CHECK ($\pm 5^{\circ}\text{C}$)?	
	AMBIENT PRESSURE CHECK (± 10 mmHg of the transfer standard)?	
	AVERAGE FLOW RATE (16.0 TO 17.34 l/min)?	
AVERAGE FLOW RATE:	l/min	%CV: % VOL SAMPLED: m ³
WAS THE FILTER STORED UNDER CONTROLLED CONDITIONS?		

	Min	Avg	Max	On Arrival Status Code:	OK-No Current Status Conditions	Mode:	Done
Amb Temp				Additional On Arrival Status Codes (if needed):			
Flow							
Press.							
Supply Mag:	Storage Mag:		Date Mag Removed:			Time Removed:	
Max Temp Diff:			Time:		Date:		
Operator Comments:							
QA Comments:							

PERFORMED BY: DATE:

VERIFIED BY: DATE:

QA Comparisons:	Staff Signatures:	
F1 File to Instrument		
F1 File to Run Data Sheet		
Run Data Sheet to PMTS		
Run Data Sheet to Shipping Log		
PM2.5 Analysis Report to PMTS		

Instructions to complete DEP 03-15-F

13. Filter Information
14. Site Name and its AQS #
15. Sampler Mfr ... sampler manufacturer's name Replace with R&P if using older equipment
16. Model ... the sampler's model
17. VSSC # ... BGI VSSC serial number
18. S/N ... serial number for the TEI 2025 or R&P 2025 (include all alpha numeric characters)
19. Filter ID ... the filter identification number on the Custody Log provided by the weigh lab
20. Start Date/Time ... the date and the start time of run in local standard time (LST)
21. Stop Date/Time ... the date and the stop time of the run in LST
22. Void ... indicate "YES" if the run was voided and "NO" if not voided
23. Blank Filter ... indicate, appropriately, if blank filters were included in the run
24. Valid Elapsed Time ... the total valid run time.

J. For the Initial Conditions

1. Did the Sampler pass the ambient temperature check ($\pm 5^{\circ}\text{C}$)? ...select "YES" or "NO"
2. Did the Sampler pass the ambient pressure check (± 10 mmHg of Agency's Transfer Standard)? ... select "YES" or "NO"
3. Did the Sampler pass the flow rate check (16.00 – 17.34 l/min)? ... select "YES" or "NO"
4. Operator's initials ... the operator's initials are required
5. Date ... the date the initial conditions were checked.

K. For the Final Conditions, place a check mark behind the appropriate response:

1. Did the Sampler pass the ambient temperature check ($\pm 5^{\circ}\text{C}$)? ... select "YES" or "NO"
2. Did the Sampler pass the ambient pressure check (± 10 mmHg of Agency's Transfer Standard)? ... select "YES" or "NO"
3. Did the Sampler pass the flow rate check (16.00 – 17.34 l/min)? ... select "YES" or "NO"
4. Enter values for "Average Flow ... l/min"; "% CV ... %" and "VOL. SAMPLED"
5. Was the filter stored under controlled conditions? ... select "YES" or "NO"
6. Information for the following may be required if the data file is lost:
7. min, avg. and max ambient temp/press values; supply and storage magazines; power failures; sampler status code and mode on arrival; Data record status; max. temp difference; time and date.
8. Date Mag Removed... the date the magazine was removed from the sampler and placed in the transport cooler
9. Time Removed... the time the magazine was removed from the sampler and placed in the transport cooler
10. Verified by ... the supervisor must sign off after the final check of the sampler's condition was performed.

15.1.7 DEP 03-15-G PM2.5 Sampler Run Data Sheet (for multiple filters)

		Florida Department of Environmental Protection				DEP 03-15	
		Sampler Run Data Sheet (Multiple Filters)				REV. No. 0: May 2016 Effective: XXXXXX	
FORM DEP 03-15-G PM2.5 SAMPLER RUN DATA SHEET (for Multiple Filters)							
SITE NAME:				AQS #			
SAMPLER MFR:				MODEL:		S/N:	
VSCC S/N							
MAGAZINE # INSTALL				MAGAZINE # PICK-UP			
MAG. REMOVAL DATE:				MAG. REMOVAL TIME:			
FILTER #	START DATE	START TIME	STOP DATE	STOP TIME	FLOW	BLANK/VOID	VALID ELAPSED TIME HOUR:MIN
INITIAL CONDITIONS				FINAL CONDITIONS			
FILTER TEMP		°C (± 2°C)		FILTER TEMP		°C (± 2°C)	
(+ 5 °C of Ambient Temp.)				(+ 5 °C of Ambient Temp.)			
Sampler Pressure				Sampler Pressure			
(± 10 mmHg Transfer Standard)				(± 10 mmHg Transfer Standard)			
Average Flow Rate				Average Flow Rate			
(16.00 to 17.34)				(16.00 to 17.34)			
				Were the filters stored under controlled conditions?			
Operator:				Operator:			
Date:				Date:			
COMMENTS:							
QA Comparisons:		Reviewed By (Signature):		Date Reviewed:			
F1 File to Instrument							
F1 File to Data Run Sheet							
Run Data Sheet to PMTS							
Run Data Sheet to Shipping Log							
PM2.5 Analysis Report to PMTS							
VERIFIED BY:				DATE:			

Instructions to complete DEP 03-15-G

L. Filter Information

1. Site Name and its AQS #
2. Sampler Mfr ... sampler manufacturer's name Replace with R&P if using older equipment
3. Model ... the sampler's model
4. VSSC # ... BGI VSSC serial number
5. S/N ... serial number for the TEI 2025 or R&P 2025 (include all alpha numeric characters)
6. Filter ID ... the filter identification number on the Custody Log provided by the weigh lab
7. Start Date/Time ... the date and the start time of run in local standard time (LST)
8. Stop Date/Time ... the date and the stop time of the run in LST
9. Blank/Void...write "blank" or "void" is applicable to filter
10. Valid Elapsed Time ... the total valid run time.

M. For the Initial Conditions

1. Filter temp (± 5 °C)? ... record the filter temperature and the ambient temperature
2. Sampler Pressure (± 10 mmHg Transfer Standard)? ... record the sampler pressure
3. Average Flow Rate (16.00 – 17.34 l/min)? ... record the average flow rate
4. Operator's initials ... the operator's initials are required
5. Date ... the date the initial conditions were checked.

N. For the Final Conditions

1. Filter temp (± 5 °C)? ... record the filter temperature and the ambient temperature
2. Sampler Pressure (± 10 mmHg Transfer Standard)? ... record the sampler pressure
3. Average Flow Rate (16.00 – 17.34 l/min)? ... record the average flow rate
4. Operator's initials ... the operator's initials are required
5. Date ... the date the initial conditions were checked.

15.1.8 DEP 03-15-H 2025/2025i SITE VISIT FORM

Form No. DEP 03-15-H

2025/2025i SITE VISIT FORM

Effective on: xx/xx/xxxx

Identification Block			
YEAR:		Site Name:	AQS #:
Instrument Mfr:		Model:	Serial #/ID #:

Date Performed						
Operator						
Date Instrument Calibrated						
NIST Traceable Time Transfer Standard						
Instrument Time						
RESULT: Time/Date Check (LIMIT: ± 1 MIN)						
Sampler Status Code						
TEMPERATURE CHECKS						
Temp Standard Mfr:						
Temp Standard S/N:						
Temp Standard Cert. Date:						
Temp Standard Temp ($^{\circ}$ C)						
Sampler Filter Temp ($^{\circ}$ C)						
Sampler Ambient Temp ($^{\circ}$ C)						
RESULT: Sampler Amb. & Filter Temp Check (LIMIT: $\pm 2^{\circ}$ C of Temp Standard)						
PRESSURE CHECKS						
Pressure Standard Mfr:						
Pressure Standard S/N:						
Pressure Standard Cert. Date:						
Reference Standard Amb. Pressure (mmHg)						
Sampler Ambient Pressure (mmHg)						
RESULT: Sampler Pressure Check (LIMIT: $\pm 10^{\circ}$ C of Reference Standard)						
External Leak Rate (mmHg/Min)						
RESULT: Sampler Leak Check (LIMIT: ≤ 25 mmHg)						
FLOW CHECKS						
Flow Transfer Standard Mfr:						
Flow Transfer Standard S/N:						
Flow Transfer Standard Cert Date:						
Flow Transfer Standard Reading (in. H ₂ O)						
Flow Transfer Standard Rate (L/Min)						
Sample Flow Rate (L/Min)						
Percent Difference of T.S. (LIMIT: $\pm 4\%$)						
T.S. RESULT: FlowRate Check (LIMIT: 16.00 TO 17.34 l/min)						
Percent Difference of Design (LIMIT: $\pm 5\%$)						
DESIGN RESULT: Flow Rate Check (LIMIT: 15.84 TO 17.5 l/min)						
MAINTENANCE CHECKS						
Maintenance Type						
Maintenance Peformed By						
VSCC S/N						
VSCC Cleaned/Changed (Change every 30 days)						
1ST Stage Inlet Changed (Y/N)						

COMMENTS (BY DATE):

Reviewed by:

Date:

Instructions to complete DEP 03-15-G

6. Year... year for site visit form
7. Site Name and its AQS #
8. Instrument Mfr ... sampler manufacturer
9. Model ... the sampler's model

A. Site Checks

1. Date Performed...date checks were performed
2. Operator... operator initials
3. Date instrument calibrated...date instrument was calibrated
4. NIST Traceable Time Transfer Standard... time from a NIST traceable device
5. Instrument Time...time from the instrument
6. Sampler Status Code...Sampler code of instrument during site visit

B. Temperature Checks

1. Temp Standard Mfr... temperature standard manufacturer
2. Temp Standard S/N... temperature standard serial number
3. Temp Standard Cert. Date... temperature standard certification date
4. Temp Standard Temp (°C)... temperature standard temperature reading
5. Sampler Filter Temp (°C)... sampler filter temperature reading
6. Sampler Ambient Temp (°C)... sampler ambient filter temperature reading

C. Pressure Checks

1. Pressure Standard Mfr... pressure standard manufacturer
2. Pressure Standard S/N... pressure standard serial number
3. Pressure Standard Cert. Date... pressure standard certification date
4. Reference Standard Ambient Pressure (mmHg)... reference standard pressure reading
5. Sampler Ambient Pressure (mmHg)... sampler ambient pressure reading
6. External Leak Rate (mmHg/min)... external leak rate reading

D. Flow Checks

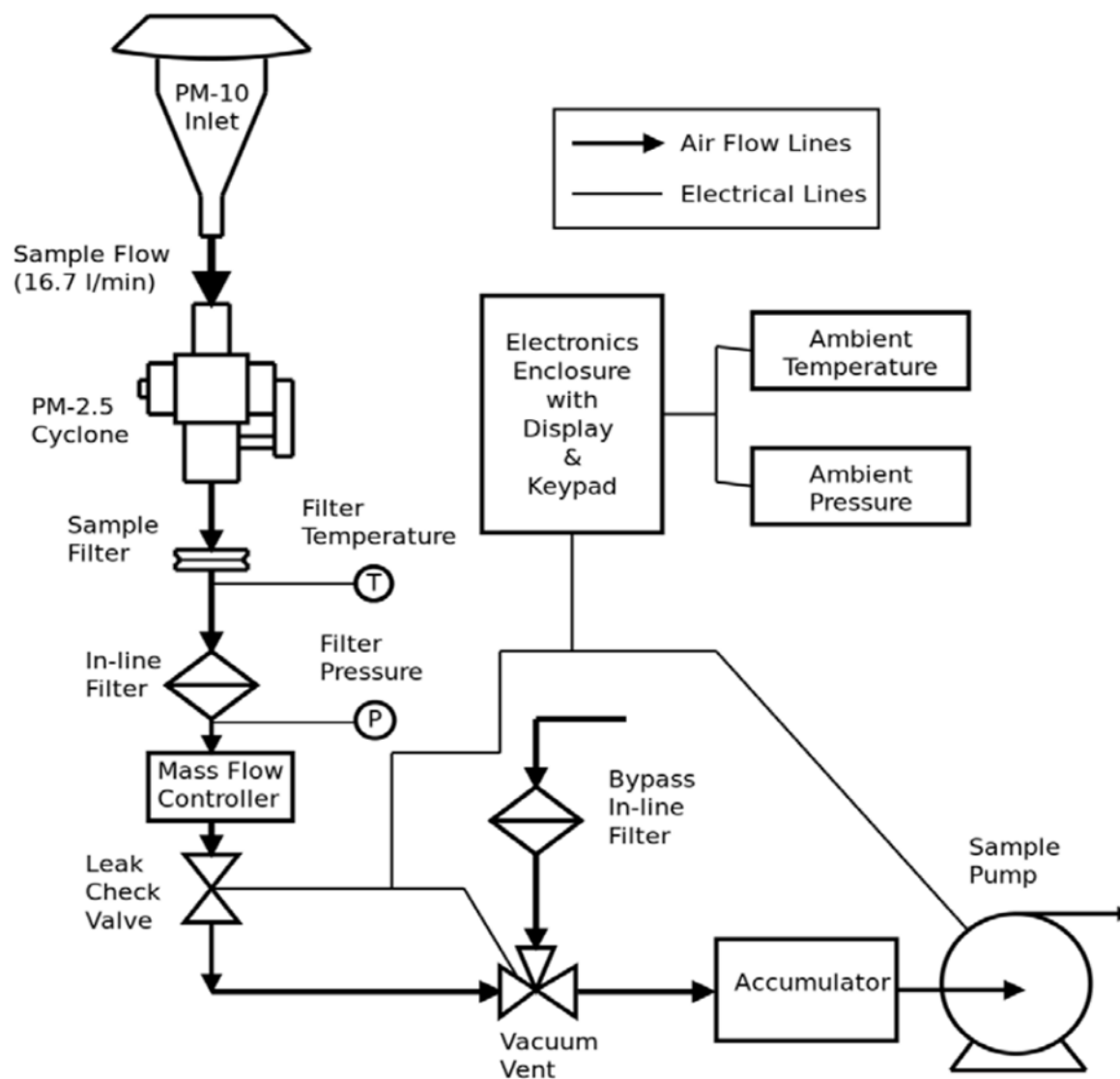
1. Flow Transfer Standard Mfr...
2. Flow Transfer Standard S/N...
3. Flow Transfer Standard Cert Date...
4. Flow Transfer Standard Reading (in. H₂O)...
5. Flow Transfer Standard Rate (L/Min)...
6. Sample Flow Rate (L/Min)...

E. Maintenance Checks

1. Maintenance Type...select scheduled or unscheduled
2. Maintenance Performed By... operator who completed maintenance
3. VSCC S/N...VSCC serial number

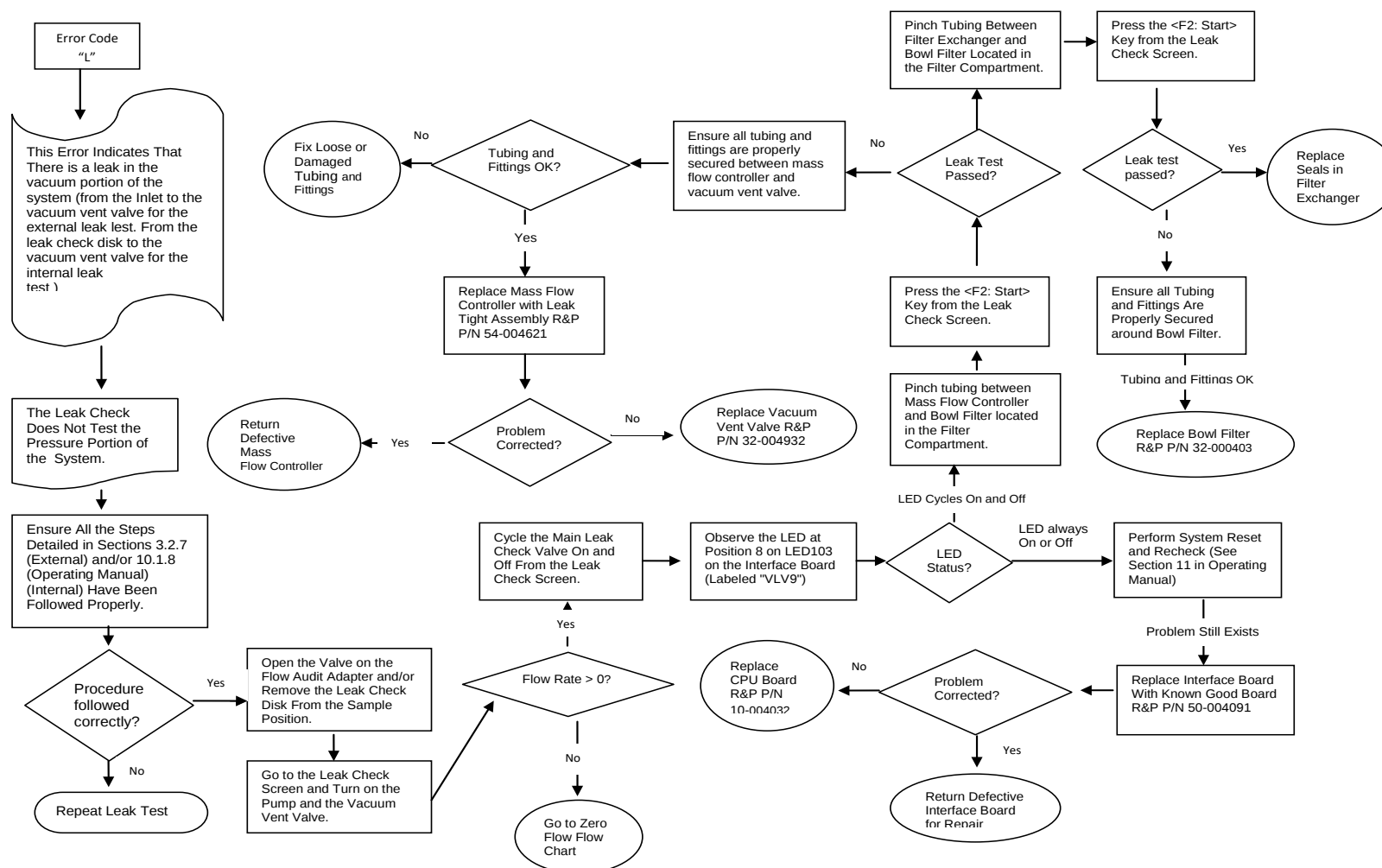
4. VSCC Cleaned/Changed (Change every 30 days)...date VSCC changed
5. 1ST Stage Inlet Changed (Y/N)... select Y if 1st stage inlet changed, N if it was not changed

15.2.2 Flow Schematic



15.3 Appendix C – Charts

15.3.1 Leak Test Failure Troubleshooting Flow Chart



16.0 Glossary

µg	Micrograms
µg/m ³	Micrograms per /cubic meter
Adj	Adjusted
Amb	Ambient
A/I	Analog input
A/O	Analog output
AQS	Air Quality System
CFR	Code of Federal Regulations
COMM1	Refers to the communication port #1
COMOM2	Refers to the communication port #2
Conc	Concentration
DEP	Department of Environmental Protection
EPA	Environmental Protection Agency
ERR	Errors
FTS	Flow Transfer Standard
Laboratory	Refers to the DEP weighing laboratory from where the PM _{2.5} filters are shipped.
L/min	Liters per minute
mmHg	Millimeter of mercury (this is a unit of pressure)
OAM	Office of air Monitoring
Press	Pressure
P-A/S	Refers to ambient pressure/ standard temperature
PM ₁₀	Particulate Matter with aerodynamic diameter of 10µg or less
PM _{2.5}	Particulate Matter with aerodynamic diameter of 2.5µg or less
QA Coordinator	QA Coordinator or member of Data Validation Staff, individual independent of operator completing reviewed form
SAMP	Refers to the sampling mode
SCC	Sharp Cut Cyclone
S/N	Serial number
T-A/S	Refers to ambient temperature/seasonal or standard temperature
THERMO	2025i Instruments manufacturer
US EPA	United States Environmental Protection Agency
VDC	Volts of Direct Current
VSCC	Very sharp cut cyclone
WINS	Well Impactor Ninety-Six
WWV	Radio call letters for the NIST