



SafeCide™ Personal Sampler System for PAA User Manual

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SAFETY ADVISORY

EVERYONE RESPONSIBLE FOR INSTALLING, USING, OR SERVICING THIS PRODUCT MUST READ THIS MANUAL CAREFULLY. LIKE ANY COMPLEX DEVICE, IT WILL PERFORM AS DESIGNED ONLY IF CONFIGURED, USED, AND SERVICED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED, AND PERSONS WHO RELY ON IT FOR THEIR SAFETY COULD SUSTAIN SEVERE PERSONAL INJURY OR DEATH.

ABOUT CHEMDAQ

A recognized innovator in occupational safety technology, ChemDAQ, Inc., designs, manufactures, and sells gas detection systems for fields as diverse as healthcare, medical device manufacturing, and the food and beverage industries. We provide comprehensive solutions for continuous area and personal monitoring and data recording, all backed by ChemDAQ's conscientiously responsive, in-depth technical support.

SPS OVERVIEW

The SafeCide™ Personal Sampler System (SPS) for peracetic acid (PAA) is a battery-powered modular device designed for use with the portable ChemDAQ E-Cell® sensor and SafeCide™ monitoring system. The SPS introduces a new dimension of operability, accuracy, and safety.

Efficient, Dependable Design

The heart of the SPS is a versatile micro-diaphragm air pump. It drives an innovative four-stage cycle that:

1. Actively and continuously draws an air sample from a specific, discrete location.
2. Delivers the sample to the integrated E-Cell sensor, which detects PAA concentrations, then relays real-time data to a monitoring device running proprietary SafeCide software for display and logging.
3. Passes the sample through a filter, specially designed for the SPS airway, to scrub PAA from the sample.
4. Discharges the filtered air sample safely back to the atmosphere.

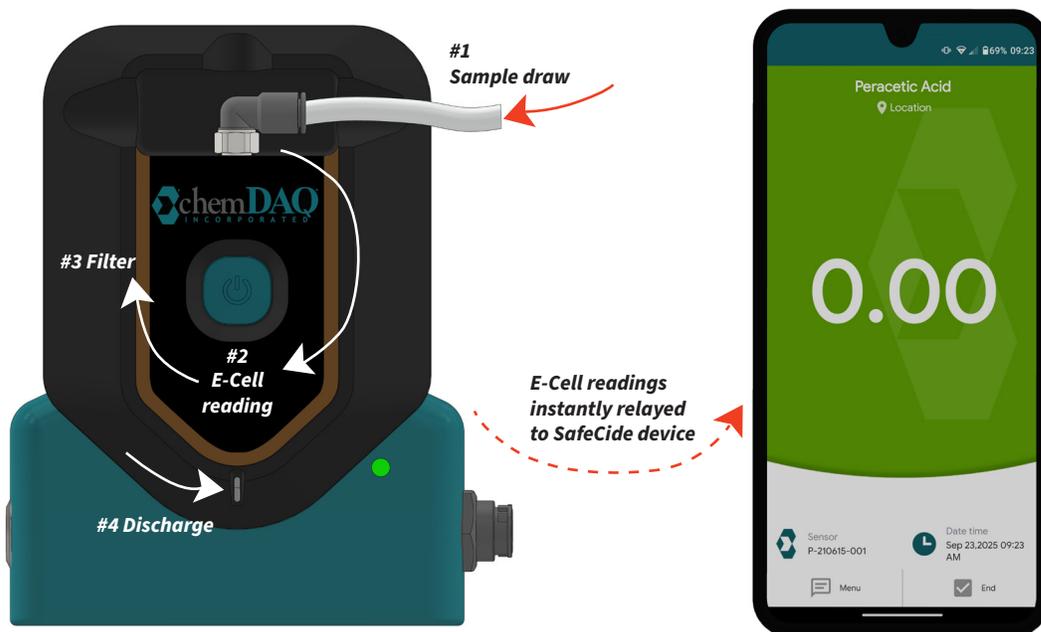


Figure 1: SPS cycle and interface with E-Cell and SafeCide device

Quick-Change Coverage

The SPS gives you two sample zone options:

- A breathing zone inlet that clips to your clothing for industrial-hygiene monitoring. (See figure 6)
- A retractable 36-inch (0.9-meter) inlet wand with a flexible 7-foot (2.1-meter) extension tube for safe remote sampling. (See figure 5)

Interchangeable without tools, both inlet options give you direct access to PAA concentrations for the SafeCide system to interpret as either real-time readings or time-weighted averages; consult your SafeCide manual for more information.

System Health at-a-Glance

In use or on standby, the SPS provides clear, reliable answers to two mission-critical questions:

- Battery: Do you have all the power you need?
 - Airway: Is the system maintaining free internal air flow, which assures reliable, accurate sampling?
- See page 11 for more information.

COMPONENTS

**TABLE 1:
COMPONENTS KEY**

1	Power button
2	USB-C charging port
3	Inlet fitting
4	Discharge vent
5	Airway Status LED
6	Alarm speaker
7	Battery Status LED
8	Belt clip
9	Backplate latch



COMPONENTS KEY

2	USB-C charging port
8	Belt clip
9	Backplate latch
10	E-Cell seal interface
11	Filter port elbows (2)
12	Chemical filter

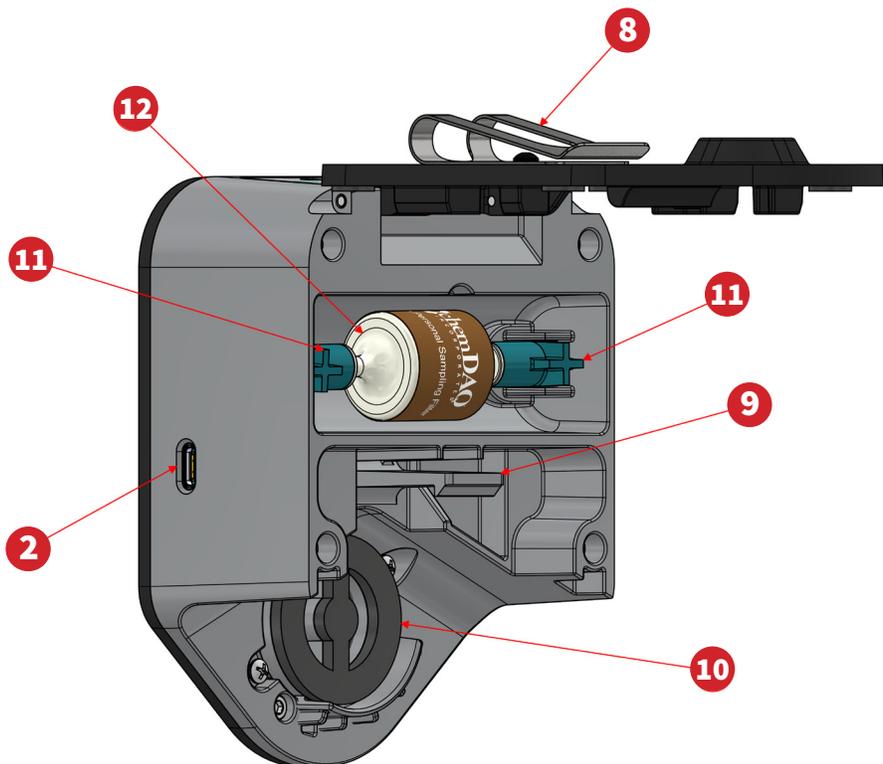


Figure 4: Back view, backplate open

ACCESSORIES

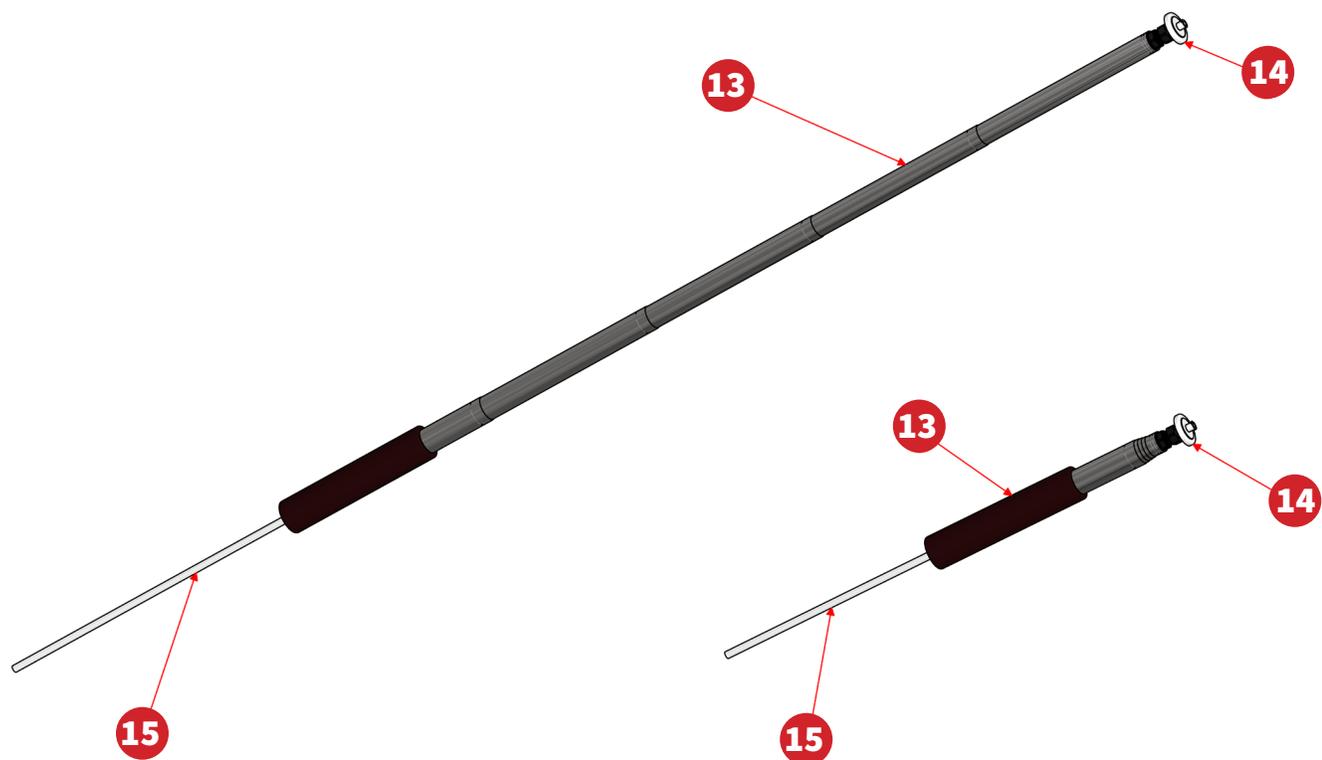


Figure 5: Wand inlet, extended (top) and retracted (bottom)

ACCESSORIES KEY

13	Sampling wand body
14	Particulate filter
15	Inlet flexible tubing

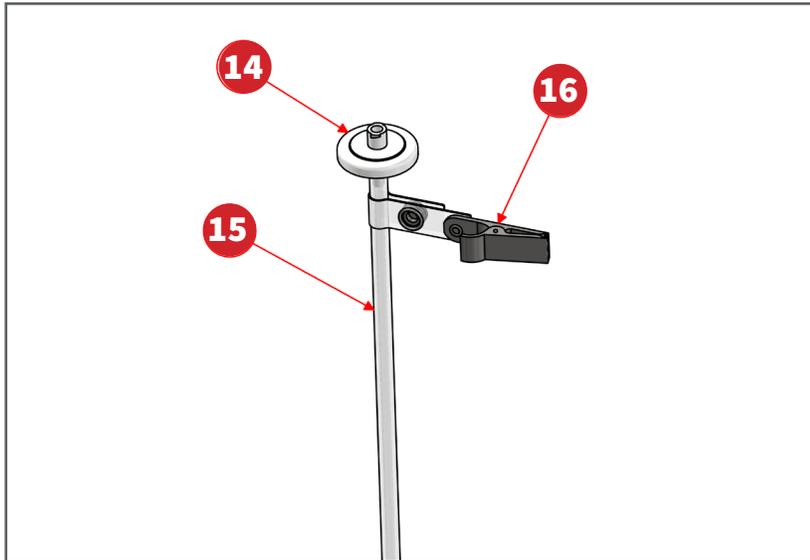


Figure 6: Breathing zone inlet

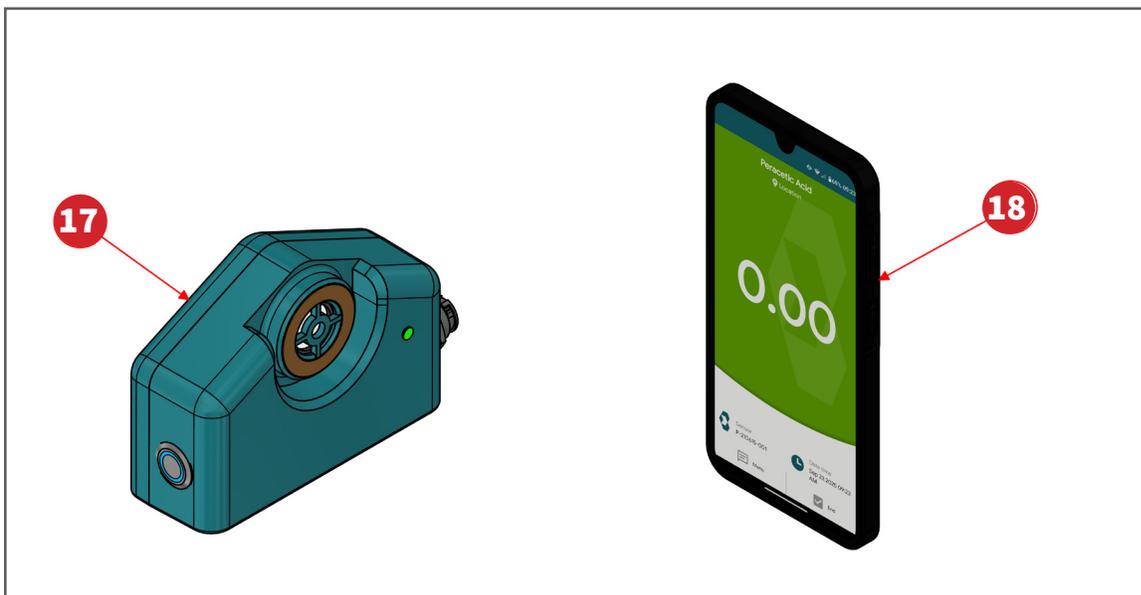


Figure 7: ChemDAQ E-Cell sensor and SafeCide device

ACCESSORIES KEY

14	Particulate filter
15	Inlet flexible tubing
16	Breathing zone inlet collar clip
17	ChemDAQ E-Cell sensor
18	ChemDAQ SafeCide device

FOR REFERENCE

COMPONENTS AND ACCESSORIES KEY (ALL)

1	Power button
2	USB-C charging port
3	Inlet fitting
4	Discharge vent
5	Airway Status LED
6	Alarm speaker
7	Battery Status LED
8	Belt clip
9	Backplate latch
10	E-Cell seal interface
11	Filter port elbows
12	Chemical filter
13	Sampling wand inlet
14	Particulate filter
15	Flexible inlet tube
16	Breathing zone inlet collar clip
17	ChemDAQ E-Cell sensor
18	ChemDAQ SafeCide device

BATTERY

The Battery Status LED and audible alarms indicate power level while your SPS is operating, and charging status while its battery is charging.



Figure 8: Top view, battery status LED and alarm speaker circled

While Operating

For operational confidence, check the Battery Status LED regularly. (See Table 2 for details)

TABLE 2: OPERATING MODE ALERTS			
BATTERY STATUS LED	AUDIBLE ALARM	STATUS	ACTION
Off	None	Battery power OK.	None
Flashing yellow	Quick tone every 30 seconds	Battery power low. SPS will operate for a limited time.	Charge ASAP.
Flashing red	Tone once per second	Battery power drained. SPS is OFF. No sample being drawn.	Charge ASAP.

While Charging

Before disconnecting your SPS from the charging cable and taking it into the field, be sure the Battery Status LED shines steady green + steady blue, indicating a full charge. (See Table 3 for details)

Table 3: CHARGING MODE ALERTS			
BATTERY Status LED	Audible Alarm	Status	Action
Off	None	No proper connection to charger. SPS not charging.	Plug in charging cable securely. (See Charging Guide, below.)
Steady green + Flashing blue	None	SPS connected to charger. Charging in progress.	Continue charging.
Steady green + Steady blue	None	SPS ready to go. Charging complete.	Use SPS at will.

Charging Guide

Charge your SPS with the included USB-C cable and charging block. Plug the cable into the charging port on the side of the SPS. See figure 9 and Table 3 for details. Keep the E-Cell docked with your SPS during storage and charging.

***NOTE:** The SPS and E-Cell must be charged separately, as each operates on its own internal battery, even when docked. Use a separate charging cable for each device.

CAUTION

- THE SPS IS NOT INTENDED TO BE USED WHILE CHARGING.
- THE BATTERY IS NOT INTENDED TO BE REPLACED BY THE USER.

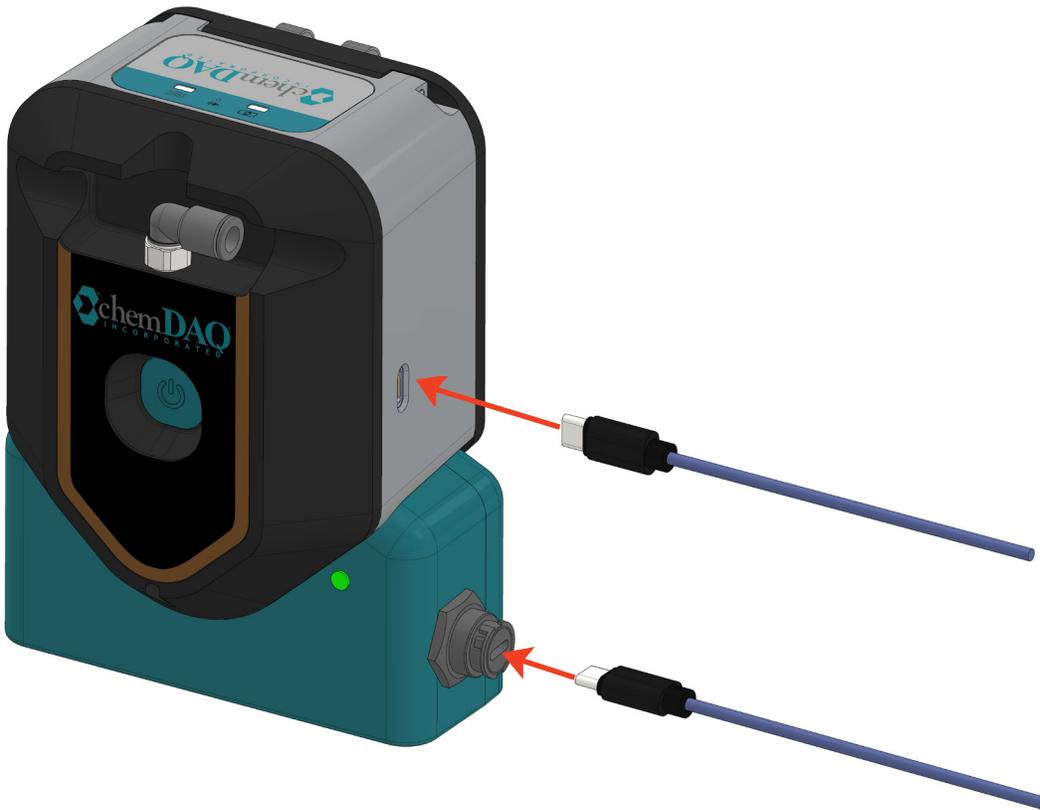


Figure 9: SPS and E-Cell separate charging ports. Each must be plugged in to charge each device.

AIRWAY PRESSURE

Consistent air flow is critical to proper SPS operation. If the air pump inlet is restricted or blocked due to a tubing kink or other obstruction, the onboard pressure sensor will trigger the flashing green, yellow, or red Airway Status LED and the audible alarm, and may shut off the SPS. We advise regular visual checks of the Airway Status LED, especially in noisy environments where the audible alarm may not be heard.

(See Table 4 for details)

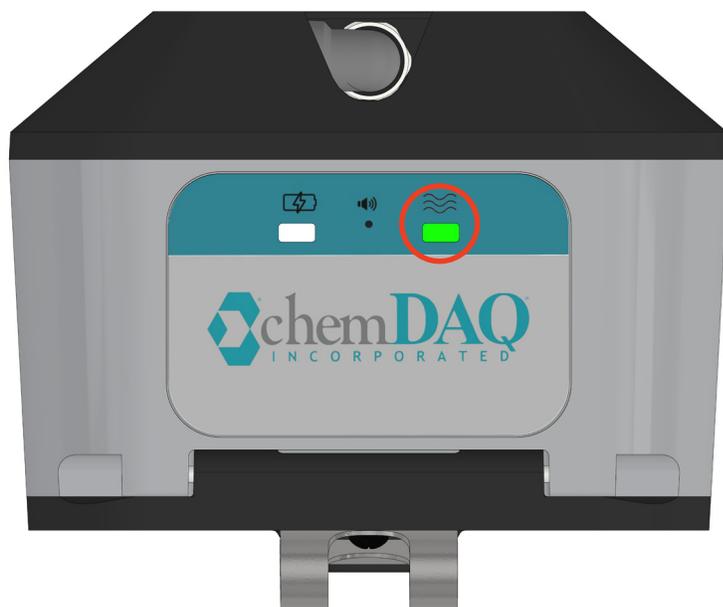


Figure 10: Top view, airway status LED circled

Table 4:
AIRWAY ALERTS

AIRWAY STATUS LED	AUDIBLE	STATUS	ACTION
Steady green	None	Normal operation.	None
Flashing green + Flashing yellow	High tone once per second	Rising inlet pressure due to restricted inlet flow. SPS may shut off.	Check inlet, tubing, or connections for kinks, obstructions, or particulate filter saturation (see page 19).
Flashing red	Deep tone once per second	Inlet pressure overload. SPS is off. No sample being drawn.	Check inlet, tubing, or connections for kinks, obstructions, or particulate filter saturation (see page 19). Reset SPS by pressing and holding the power button for 2 seconds.

FILTERS

For safe, proper operation, the SPS comes equipped with two filters:

- A *particulate filter*, at the tip of either inlet accessory, that keeps out destructive dust and liquids.
- A *proprietary chemical filter*, downstream of the E-Cell sensor, that scrubs PAA from the sample so the SPS pumps clean air safely back to the atmosphere.

Particulate Filter

Both inlet accessories come with the particulate filter already installed. Excessive dust or humidity — or immersion in a liquid — may saturate the particulate filter and restrict air flow. For the SPS, this can mean high or overload airway pressures (see Table 4, page 11). If this happens, replace the filter with an authorized spare from ChemDAQ.

CAUTION

NEVER OPERATE AN SPS WITHOUT A PARTICULATE FILTER. DOING SO MAY RESULT IN PERMANENT DAMAGE TO THE ONBOARD AIR PUMP AND THE E-CELL.

Install a new particulate filter by sliding the barbed end all the way into the tip of the sampling wand or breathing zone inlet.

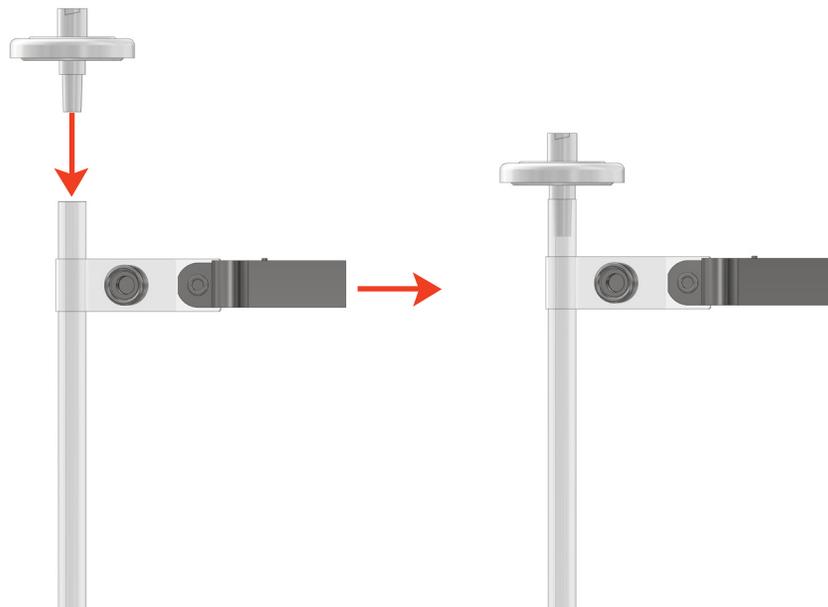


Figure 11: Insertion of particulate filter into breathing zone inlet flexible tubing

Chemical Filter

The pre-installed chemical filter has a one-year service life and is user-serviceable. ChemDAQ will supply a new filter automatically each year, but you can contact ChemDAQ for additional replacements.

To remove an old filter:

1. Place your SPS on a clean, flat surface and unlatch the backplate. If the E-Cell sensor is docked with the SPS, steady it with one hand to avoid dropping or damaging it.

CAUTION

NEVER FORCE THE BACKPLATE OPEN PAST THE 90° POSITION. EXCESSIVE FORCE WILL DAMAGE THE BACKPLATE AND THE SPS HOUSING.

2. Pinch the plus (+) marker on one of the two rubber port elbows. Rock the elbow back and forth to loosen it from the nipple on the filter chamber wall. Repeat this step for the other elbow.
3. Dispose of the old filter and elbows per local regulations and industry best practices for waste disposal.

To install a new filter:

1. Unwrap the filter and inspect it for flaws or potential leaks. Make sure the rubber elbows are flush with the shoulders on the filter's ends and that the plus (+) markers are facing you.



Figure 12: SPS chemical filter for PAA

CAUTION

TO ENSURE COMPLETE FILTRATION, ALWAYS REPLACE AN OLD FILTER WHEN YOU RECEIVE A NEW ONE.

2. With the plus (+) markers facing you, press both rubber elbows firmly onto the filter chamber nipples. Make sure all components fit together snugly. (A fresh filter has no preferred left or right end. Don't worry about orienting it.)

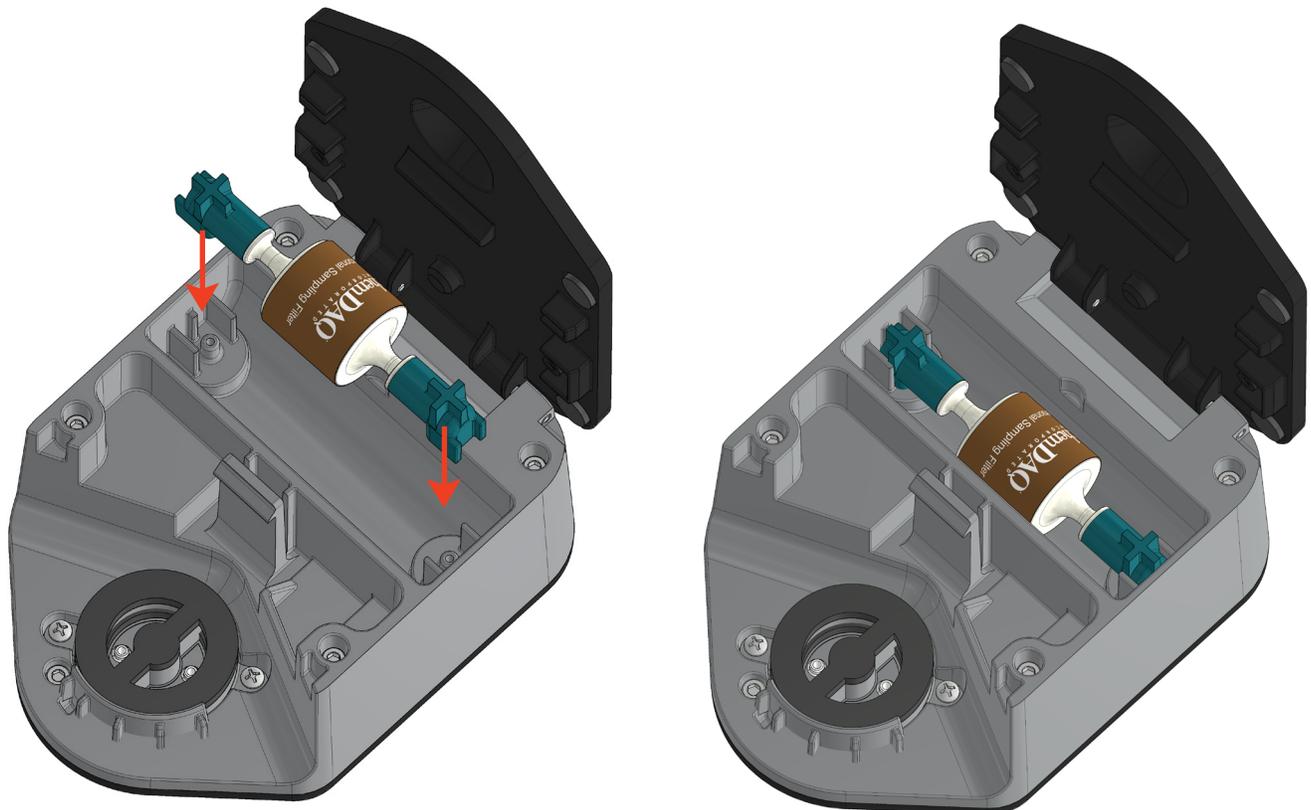


Figure 13: Inserting replacement chemical filter

OPERATING THE SPS

A single button manages all core functions. For ON, OFF, or a normal RESET, push and hold the power button for two seconds. You'll need to reset your SPS if it shuts off due to a low battery or a pressure overload. For a HARD RESET (in case of a charging-equipment error or similar fault), press and hold the button for 10 seconds.



Figure 14: Front view, power button highlighted

PRE-SAMPLING CHECKLIST

Before taking the SPS into the field, always:

1. Make sure the battery is charged (see page 9).
2. Make sure a chemical filter is in place (see page 13).
3. Dock your E-Cell module with the SPS:
 - a. Place the SPS on a clean, flat surface and unlatch the backplate.

CAUTION

DO NOT FORCE THE BACKPLATE PAST THE 90° POSITION. EXCESSIVE FORCE WILL DAMAGE THE BACKPLATE AND THE SPS HOUSING.

- b. Place the E-Cell's sensor opening against the cushioned sensor chamber inside the SPS, mating the contour of the E-Cell with the sensor chamber's shape. (See figure 15A)
 - c. Close the backplate, engaging the latch and locking the E-Cell in place. (See figure 15B-15C)

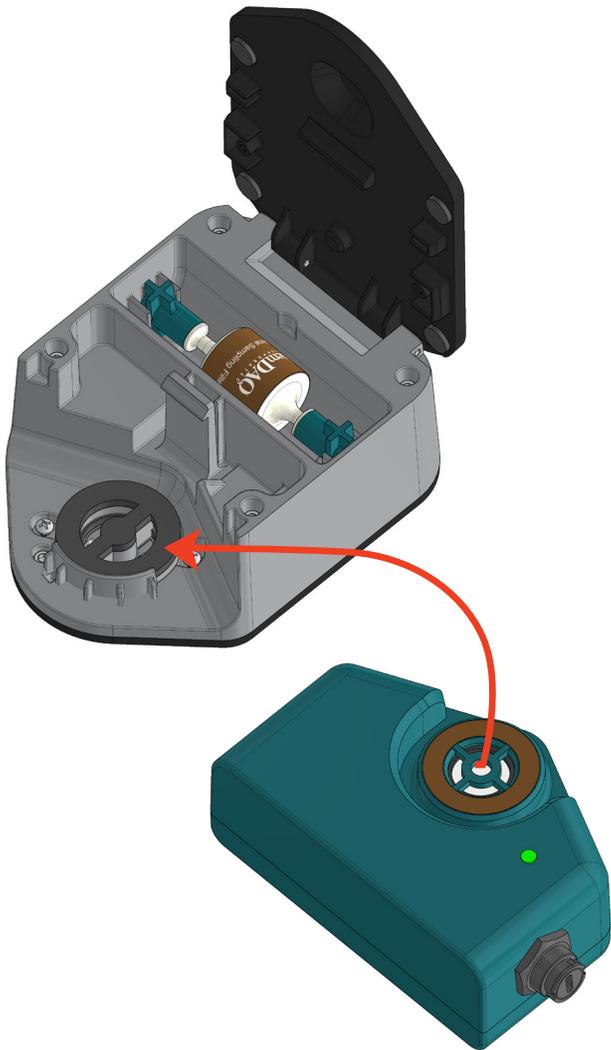


Figure 15A: Place E-Cell sensor opening against SPS cushioned sensor chamber

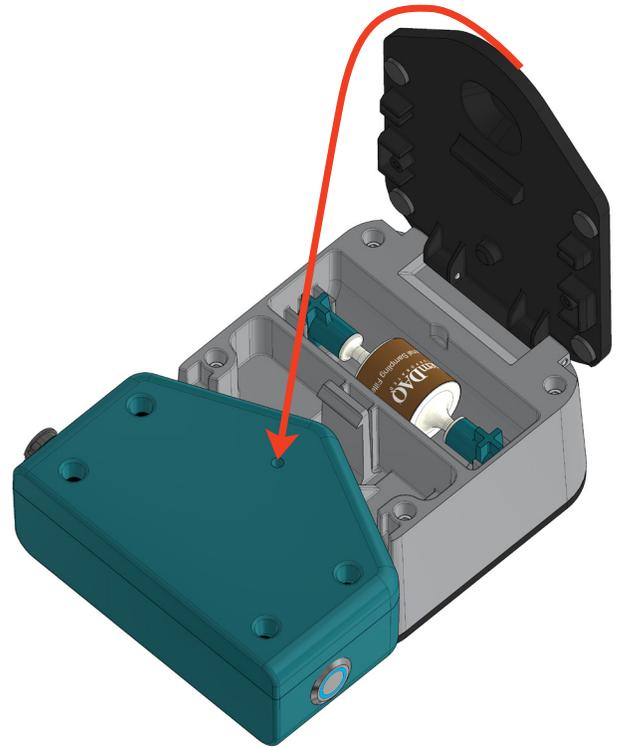


Figure 15B: Close the SPS backplate and engage the latch

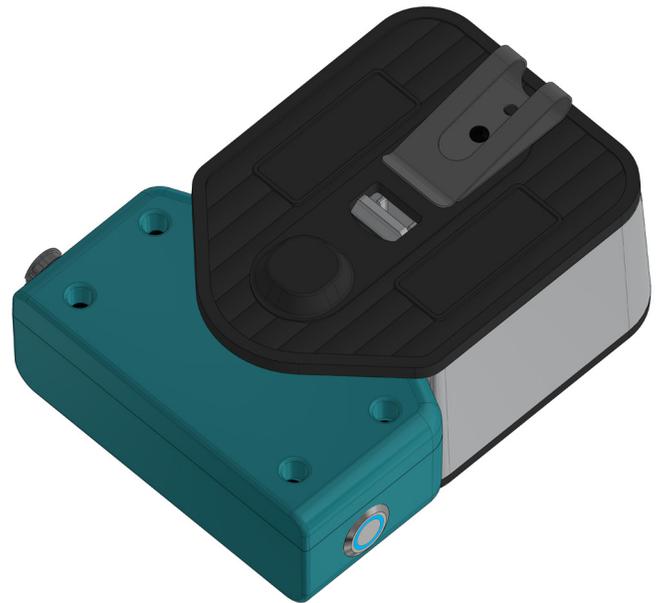


Figure 15C: E-Cell is locked in place within the SPS

4. Attach your preferred sampling accessory by sliding the open end of the flexible tubing into the SPS inlet fitting. Give the tubing a light tug to make sure it is securely connected. (See figure 16)
5. Make sure a particulate filter is mounted on the accessory's inlet end. (See figure 11, page 12)

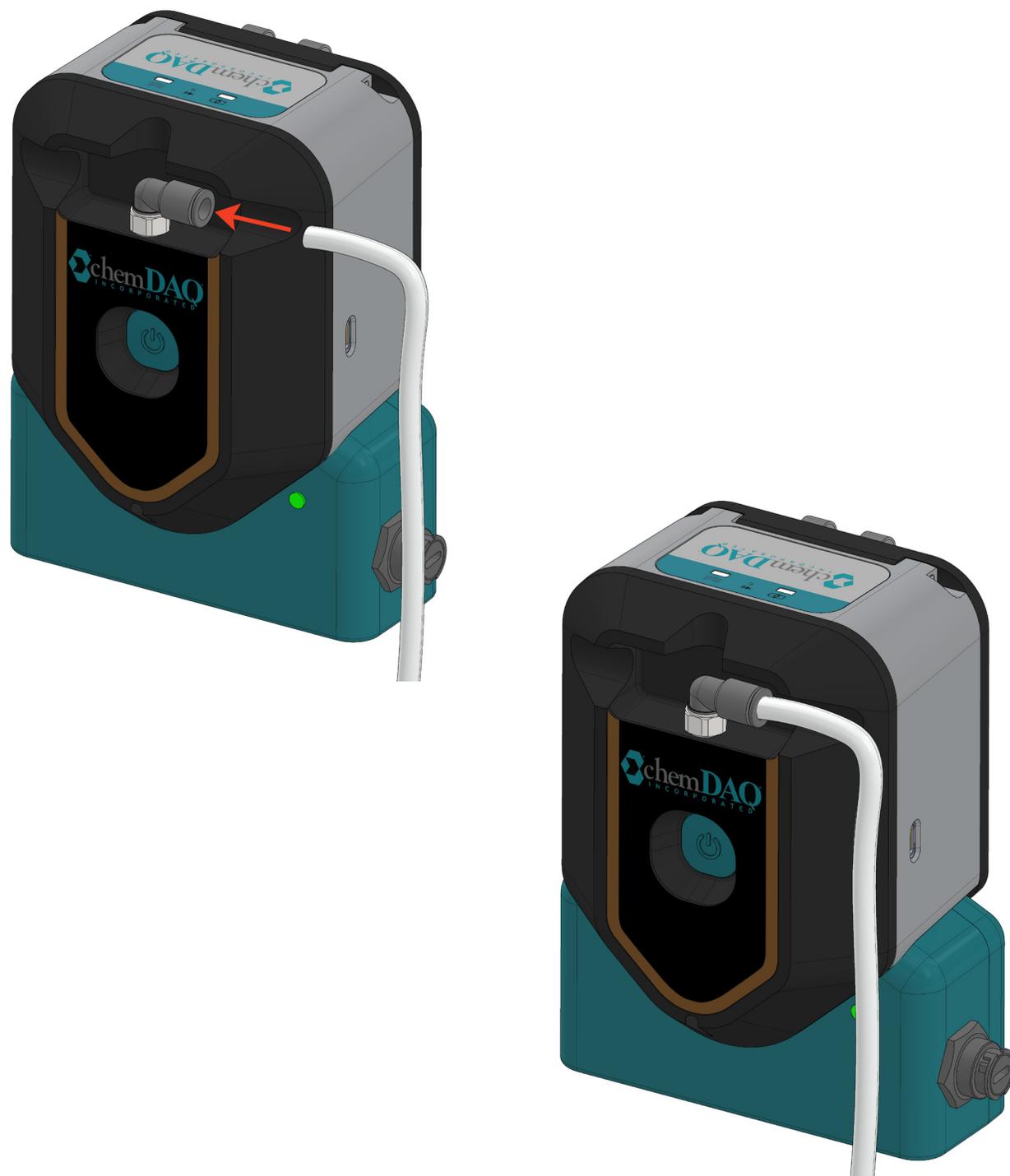


Figure 16: Insert sampling accessory tubing into SPS inlet fitting

CAUTION

AIR LEAKS CAN LEAD TO INACCURATE SAMPLE MEASUREMENTS. TO MAKE SURE THE WHOLE SYSTEM IS AIRTIGHT BEFORE TAKING IT INTO THE FIELD, SEE CHECKPOINT ITEM 6, BELOW.

6. Make sure the internal airway is tight from end to end:
 - a. Press and hold the power button for 2 seconds. (See page 14) The Airway Status LED will light up and remain a steady green.
 - b. Place your finger over the open end of the particulate filter to temporarily block the sampling accessory inlet.
 - i. If there are NO leaks, the pump will audibly stall, the Airway Status LED will alternate between yellow and green, and the alarm will sound once per second.
 1. Maintain the blockage for 5-10 seconds. The SPS will automatically shut off, the Airway Status LED will flash red, and the alarm will sound a deep tone once per second.
 2. Press and hold the power button for 2 seconds to reset the SPS. You're good to go.
 - ii. If there ARE leaks in the system, the pump will continue to run normally, even with a blocked inlet. Inspect the areas where leaks are most likely:
 1. E-Cell sensor chamber. Backplate should be latched and E-Cell resting on the seal interface. (See pages 14-15)
 2. Particulate filter. Particulate filter barb should be fully inserted into end of flexible tubing. (See page 12)
 3. Inlet flexible tubing. Holes in tubing can occur due to wear-and-tear, punctures, or cuts.
 4. Inlet attachment fitting. Flexible tubing should remain in the fitting when given a light tug (See page 16)
 5. Chemical filter connection. Filter elbows should be flush with the shoulders on the filter's ends and fully cover the filter chamber nipples (See page 13)

Still can't locate the leak? Contact ChemDAQ Technical Services.

CHEMDAQ TECHNICAL SERVICES DEPARTMENT
TECHSERVICE@CHEMDAQ.COM
(800) 245-3310 X310 OR (412) 787.0202 X310

If the SPS assembly passes all six checkpoints, it's ready for use. Before taking it into the field:

- Review the E-Cell and SafeCide user manuals.
- If you choose to use the included ChemDAQ work belt, clip the combined SPS/E-Cell assembly to the belt and position the assembly comfortably as needed while you work.
- If wearing the assembly on the backside of your belt, check Airway Status and Battery Status LEDs occasionally to ensure your SPS is operating properly.

SAMPLING PROCEDURES

The SPS is designed to collect samples and log data autonomously but, as the operator, you must monitor battery and airway conditions to ensure proper sampling. See pages 9 and 11 for details.

Breathing Zone Sampling

Slide the free end of the breathing zone attachment tubing into the SPS inlet (see page 16) and clip the top end of the attachment to your clothing within the OSHA-recommended 6-to-9-inch radius of your nose and mouth. Additional clips (included) can secure the tubing to multiple points on your clothing if needed.

CAUTION

- BEWARE OF SATURATION OF THE PARTICULATE FILTER (SEE HUMIDITY & CONDENSATION, BELOW.)
- IN A NOISY ENVIRONMENT, YOU MAY NOT HEAR THE AIRWAY OR BATTERY ALARMS, SO CHECK THE LEDS REGULARLY TO ENSURE YOUR SPS IS OPERATING PROPERLY. (SEE PAGES 9 AND 11 FOR LED CODES.)

Point Sampling

Slide the free end of the sampling wand flexible tubing into the SPS inlet (see page 16), then extend the wand to the desired length.

CAUTION

DO NOT PULL ON THE PARTICULATE FILTER TO EXTEND THE WAND.

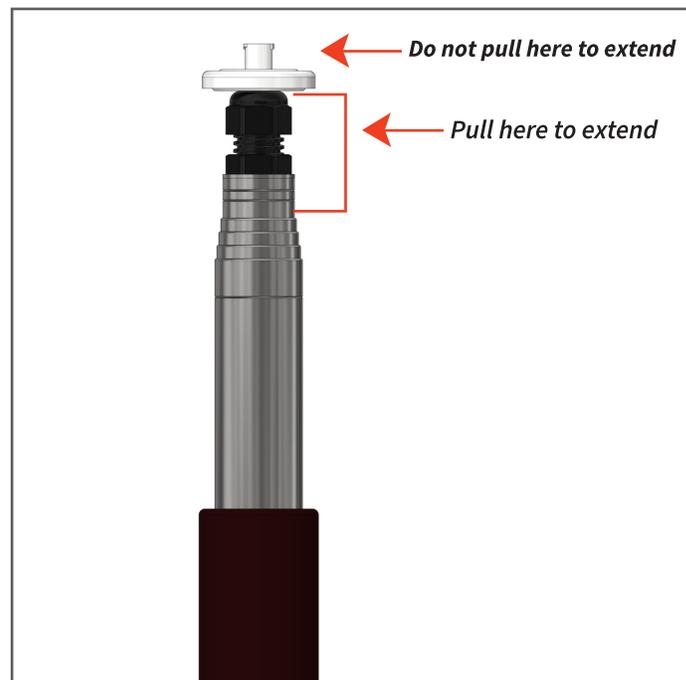


Figure 17: How to extend the sampling wand

In point sampling, the E-Cell will detect a change in PAA concentration immediately, but will take about 2 minutes to reach a 90% stable reading. For precise concentration value logging, allow at least 2 minutes for sampling at any one point.

***NOTE:** To prevent the flexible tubing inside the wand from kinking, retract the wand by carefully sliding the metal sections together. Begin by telescoping the sections closest to the handle. (See figure 18)

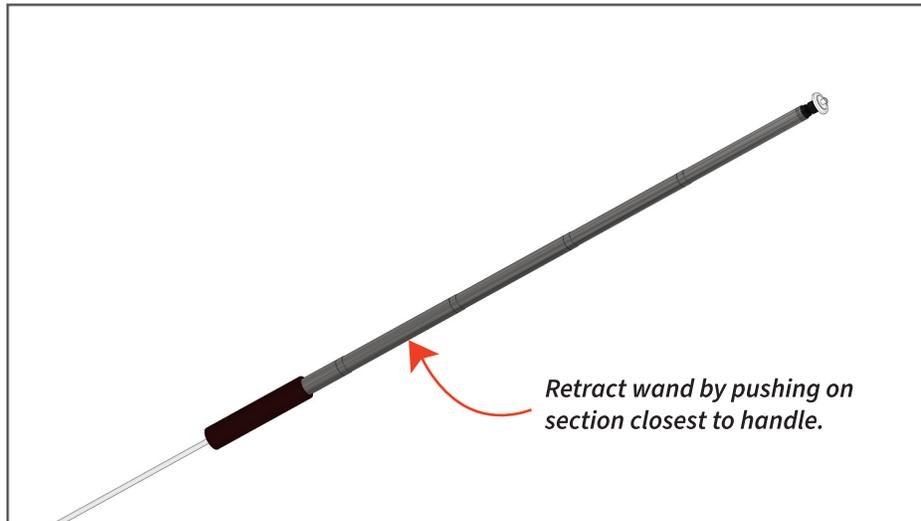


Figure 18: How to retract sampling wand

CAUTION

- NEVER ATTEMPT TO DRAW LIQUID SAMPLES.
- BEWARE OF CONDENSATION INSIDE THE SAMPLER TUBING. (SEE HUMIDITY & CONDENSATION, BELOW)
- IN A NOISY ENVIRONMENT, YOU MAY NOT HEAR THE AIRWAY OR BATTERY ALARMS, SO CHECK THE LEDS OCCASIONALLY TO ENSURE YOUR SPS IS OPERATING PROPERLY. (SEE PAGES 9 AND 11 FOR LED CODES)

HUMIDITY & CONDENSATION

The SPS can be affected by environmental conditions such as temperature and humidity, but these affects can be mitigated to ensure proper operation.

The particulate filter can become saturated if exposed to excessive humidity (>75% RH) for an extended period of time (2+ hours). This can restrict airflow and trigger the Airway Status Alerts. See page 12 for instructions to replace particulate filter.

When point sampling with the wand, moisture can condense inside the SPS tubing if the air sample temperature differs sharply from the SPS system temperature. To prevent condensation and preserve functionality:

- Keep sampling times short when temperature/humidity differentials are high.
- Avoid sudden changes in temperature or humidity as you move around your sampling environment.
- If possible, give your SPS time to warm up or cool down to match your surroundings.
- Routinely monitor for visible condensation inside flexible tubing.

CAUTION

CONDENSATION CAN LEAD TO INACCURATE SAMPLE MEASUREMENTS. IF YOU SEE CONDENSATION, DISCONNECT THE TUBING AND ALLOW IT TO DRY OUT.

For backup sampling accessories that enable you to rotate components in case of condensation, contact ChemDAQ Technical Services.

TROUBLESHOOTING

**Table 5:
TROUBLESHOOTING**

PROBLEM	CAUSE	RESOLUTION
SPS will not start	Low battery	Charge for 1-2 hours before use. (See pages 8-9)
SPS shuts off; Battery Status LED flashes red; alternating alarm sounds	Low battery	Charge for 1-2 hours before use. (See pages 8-9)
SPS shuts off; Airway Status LED flashes red; alternating alarm sounds	Inlet pressure overload	1. Check flexible tubing for kinks or obstructions. Unkink or unblock. 2. Check particulate filter for saturation, replace. (See page 12)
Battery status LED stays dark while charging cable is plugged in	Error in charging circuit	1. Ensure charging cable is properly plugged into SPS and charging unit. (See pages 9-10) 2. Swap out charging cables/block. 3. Perform a hard reset: Hold power button in for 10 sec.
During airtight checks, SPS does not shut off in 5-10 seconds	Leak in system	Check areas where leaks are most likely. (See page 17)
Pump runs but LEDs do not turn on	Electrical error or disconnection	Contact ChemDAQ Technical Services.
LEDs light up but pump does not run	Electrical error or disconnection	Contact ChemDAQ Technical Services

MAINTENANCE

Store your SPS and accessories in a dry environment between 32°F and 95°F (0°C and 35°C). For cleaning, wipe down the module and accessories with a soft, damp cloth and an alcohol-free cleaning agent.

CAUTION

- DO NOT SUBMERGE MODULE OR ACCESSORIES IN WATER OR ANY OTHER LIQUID.
- DO NOT SUBJECT MODULE OR ACCESSORIES TO DIRECT SPRAY-DOWNS.
- IF USING OUTSIDE, KEEP COVERED FROM RAINFALL.

Periodically inspect the inlet tubing for blockage or leaks. Contact ChemDAQ for replacement parts. Other than the hinged backplate, do not open or attempt to open any part of the SPS module or accessories. Chemical filters have a one-year lifespan. ChemDAQ will automatically supply a new filter once a year. Contact ChemDAQ for additional filters.

COMPONENT SPECIFICATIONS

The SPS is designed to operate within these parameters:

- Temperature 32°F to 122°F (0°C to 50°C)
- Relative humidity 10% to 95% RH, non-condensing
- Altitude Maximum 10,000 ft (3,000 m), constant pressure

Device

Manufacturer's part number	900-0040
Materials	ABS housing
User-replaceable batteries	None
Maximum current draw	150 mA
Dimensions (W x H x D)	4" x 5" x 3" (10 cm x 13 cm x 8 cm)
Weight	<1 lb (0.5 kg)

Wand Inlet

Manufacturer's part number	825-0004
Materials:	
Shaft	201 stainless steel
Tubing	PVC
Sheathing	PET plastic
Tip	PA; PP w/ PTFE membrane
Dimensions:	
Retracted	10 ½" + 6' excess tubing (0.27 m + 1.8 m excess tubing)
Extended	3'-1" + 4' excess tubing (0.9 m + 1.2 m excess tubing)
Weight	<1 lb (0.5 kg)

Breathing Zone Inlet

Manufacturer's part number	825-0005
Materials:	
Tubing	PVC
Sheathing	PET plastic
Tip	PP w/ PTFE membrane
Dimensions	4'-0" (1.2 m)
Weight	<1 lb (0.5 kg)

PAA Filter

Manufacturer's part number	692-0003
Materials	ABS housing
Dimensions	2½" x 1" x 1" (6.3 cm x 2.5 cm x 2.5 cm)

E-Cell

See E-Cell User Manual.

SafeCide Monitoring System

See SafeCide User Manual.

LEGAL NOTICE

The warranties made by ChemDAQ, Inc., in our Standard Terms and Conditions with respect to these products are voided if the products are not installed, used, and serviced in accordance with the instructions in this manual. Please protect yourself and others by following these instructions. Call or e-mail the ChemDAQ Technical Services Department* with all questions regarding use or repairs.

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