863 Valley View Road, Eighty Four, PA 15330
724-941-9701
skcinc.com

AirChek Essential+ Sample Pump

Cat. No. 220-3100

Operating Instructions

Figure 1. AirChek® Essential+ Overview

Table of Contents

Checking Pump/Kit Contents

Use the following table to verify that you received all items associated with the Cat. No. ordered. If you are missing items, contact SKC at 800-752-8472 (U.S. only) or 724-971-9701.

If you ordered Cat. No.	Your package should contain
220-3100	**Pump only** with Li-Ion battery pack and screwdriver set
220-3100-S	**Starter Kit** includes pump as described above, Lite Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie **100-240 V**
220-3100-K	**Single High Flow Kit** includes pump as described above, Lite Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case **100-240 V**
220-3100-KD	**Single High/Low Flow Kit** includes pump as described above, Lite Charging Cradle, power supply with cord, filter cassette holder, All-in-One adjustable tube holder, and Type A protective tube cover, in a soft-sided nylon carry case **100-240 V**
220-3100-K3D	**3-pack High/Low Flow Pump Kit** includes 3 pumps as described above and 3 each: Lite Charging Cradles, filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers; and one multi cradle power supply and splitter in a hard-sided case **100-240 V**
220-3100-K5	**5-pack High Flow Pump Kit** includes 5 pumps as described above and 5 each: Lite Charging Cradles and filter cassette holders; and one multi cradle power supply and splitter in a hard-sided case **100-240 V**
220-3100-K5D	**5-pack High/Low Flow Pump Kit** includes 5 pumps as described above and 5 each: Lite Charging Cradles and power supply with cord, filter cassette holders, All-in-One adjustable tube holders and Type A protective tube covers; and one multi cradle power supply and splitter in a hard-sided case **100-240 V**

Charging the Battery Pack

Set up the charging train (*Figure 2*) and completely charge the battery pack(s) before operating the pump.

1. Prepare charging cradle(s).
    a. **Single cradle**: Insert connector on Single Cradle Power Supply Cat. No. 220-600 into power port on back of Lite Charging Cradle Cat. No. 220-850. Insert wall cube into a 100 to 240-volt wall outlet.
    b. **Up to five cradles**: Using Multi Cradle Power Supply and Splitter Cat. No. 220-851, first connect power supply and splitter. Insert a splitter connector into power port on back of Lite cradle and repeat with up to five connectors and cradles. Plug power supply into a 100 to 240-volt wall outlet.
2. Align the charging contacts on the bottom edge of the pump with the charging contacts inside the cradle and place the pump in the cradle. Repeat for each additional pump/cradle.
3. Charge the battery completely (approximately 3 hours). The left LED on the cradle will indicate charge status. S*ee Reading Charge Status on Cradle LED*.

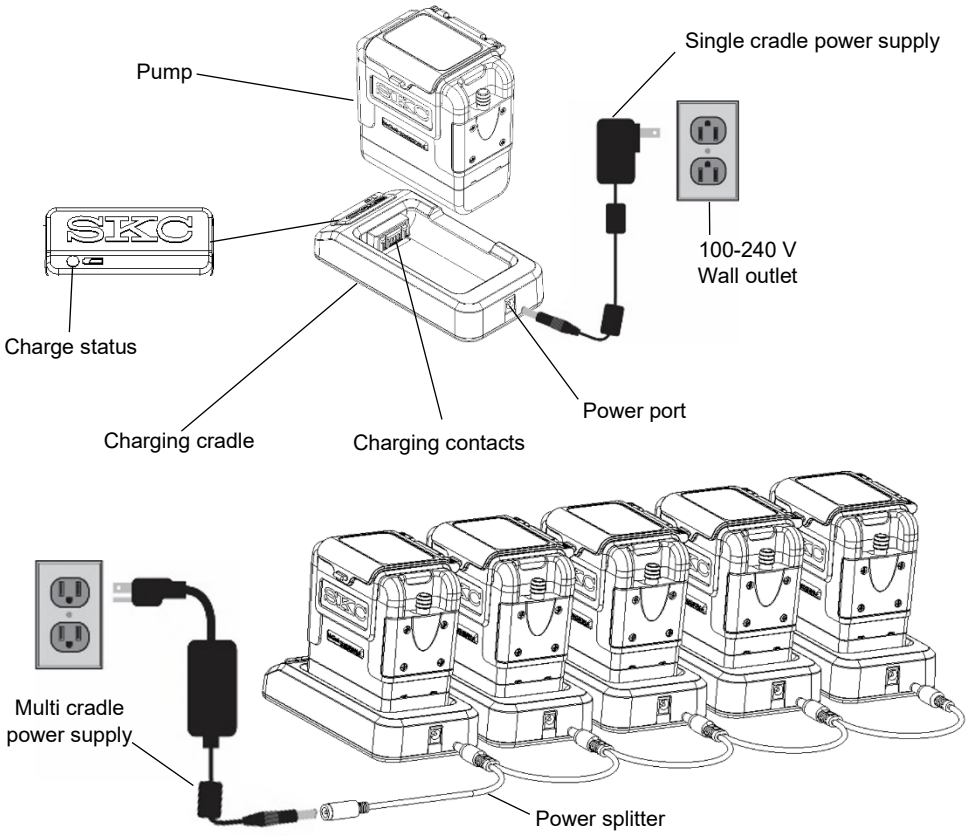


Figure 2. Charging Train, Single and Multiple Cradles

Reading Charge Status on Cradle LED

LED Action			Charge Status
Red steady			Charge in progress
Red 3 sec	Green 1 sec	(Pattern repeats)	Approximately 75% charged
Green steady			Charge completed/trickle charge

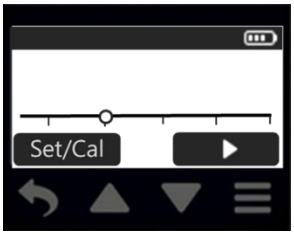
Notes and Cautions

- Power off pump before removing battery.
- Use only the SKC charging cradle Cat. No. 220-800, 220-850, or 220-900 for pump.
- Failure to follow warnings, notes, and cautions may cause injuries and voids any warranty.
- WARNING: Substitution of components may impair intrinsic safety. AVERTISSEMENT: La substitution de composants peut compromettre la Sécurité Intrinsèque.
- CAUTION: The battery used in this device may present a risk of fire or explosion when heated above 212 F (100 C) or incinerated. Replace battery with SKC Battery Pack model P75718 only. Use of another battery may present a risk of fire or explosion.
- WARNING: To prevent ignition of a hazardous atmosphere, batteries must only be changed [removed and replaced] in an area known to be non-hazardous. AVERTISSEMENT: Afin de prévenir l'inflammation d'atmosphères dangereuses, ne changer les batteries que dans des emplacements désignés non dangereux.
- Maximum charge input voltage is U_m = 12 V
- CAUTION: Risk of Fire and Burns. Do Not Disassemble, heat above 212 F (100 C), or incinerate. Keep battery out of reach of children and in original package until ready to use. Dispose of used batteries promptly according to [all state and] local recycling or waste regulations.
- User may replace external components such as the inlet filter, battery, protective screen cover, and/or belt clip. Service must be done by SKC to maintain performance and IS rating. Warranty is void if pumping compartment is opened by user.

For more information on SKC pump lithium-ion (Li-Ion) battery packs, visit www.skcinc.com/knowledgecenter.

Turning Pump Power On/Off

Turn <u>on</u>: Press the recessed power on/off button on the side of the pump (*Figure 1*). The screen will light up and the Sample menu will be displayed (*see below*).



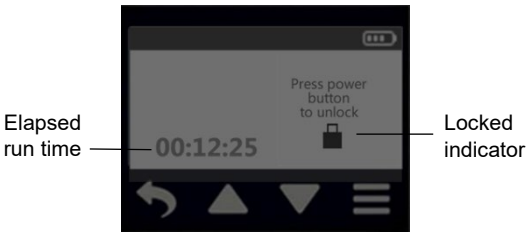
Turn <u>off</u>: Press the recessed power on/off button on the side of the pump. ***Note****: To conserve battery power, a non-sampling pump will power off automatically after 5 minutes of inactivity.*

Note*: The power on/off button also locks/dims and unlocks/undims the touch screen during sampling. (See Options on Pump Screen During Sampling on page 17.)*

Interpreting the Display

The battery status icon (charge remaining) is displayed at the top of every screen.

Elapsed run time is displayed during sampling. The lock icon indicates that the screen is locked to prevent accidental tap errors or tampering (*see Auto Lock*) during sampling. When the power button is pressed to unlock or AutoLock is set to Off, the screen on the right is displayed.



Display during sampling when Auto Lock is on

Display during sampling when Auto Lock is off

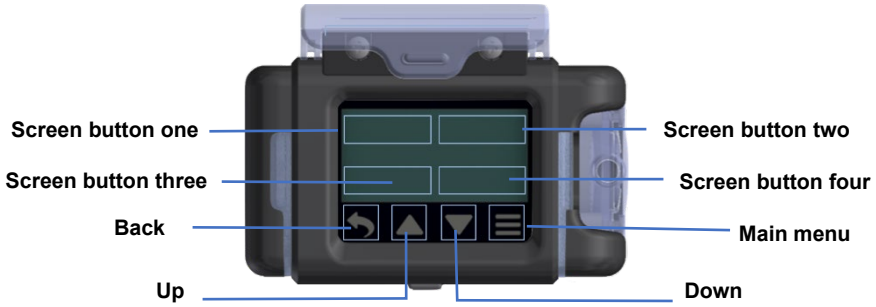
Determining Battery Charge Status

The battery status icon at the top right of the pump display screen has four bars that decrease in number as battery charge is depleted. Use the table below to interpret the battery status.

Icon Displayed	Battery Charge Remaining
Four bars	Full battery charge, approximately 75 to 100%
Three bars	Approximately 50 to 75%
Two bars	Approximately 25 to 50%
One bar	Approximately 5 to 25%
No bars	Low battery fault is imminent. Pump will stop and power off eventually. “FAULT!” will appear on the screen once the pump is restarted.

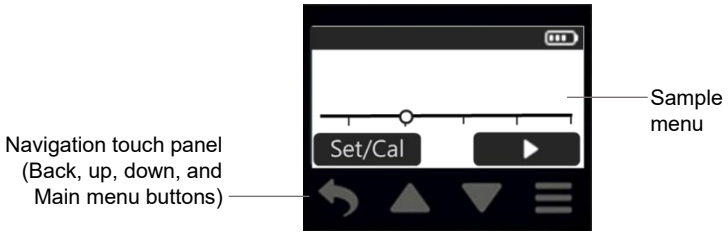
Using the Touch Screen

Use fingertip to gently touch screen buttons in the active zones indicated below.



Navigating Menus and Screens

AirChek Essential+ operates through a series of menus and screens. When the pump is powered on, the Sample menu appears (*see below*), from which you can set or calibrate flow rate and/or sample immediately. The navigation touch panel below the screen contains buttons used to move among screens or increase/decrease values as described in the table below. *Also see Main Menu Options and Screen Touch Buttons.*



Navigation Buttons

Back	**Up Arrow**	**Down Arrow**	**Main menu**
Returns to previous screen 	Increases value in 0.01-L/min increments in Set/Cal  Touch to adjust flow setting; touch and hold to speed increment of flow setting.	Decreases value in 0.01-L/min increments in Set/Cal  Touch to adjust flow setting; touch and hold to speed decrement of flow setting.	Opens Main menu with Auto Lock, Info, and Sample options. 

Screen Touch Buttons

Button	General Function
	Saves flow rate after calibration, resets accumulated sample run time, and returns to Main menu or Sample menu
	Decreases or increases flow in 0.5-L/min increments in Set/Cal
	Starts sampling
	Pauses sampling. Elapsed time accumulation pauses. When Start is touched, sampling will resume and time will continue to accumulate.
	Stops sampling

Determining Pump Status

The status LEDs that bracket the screen display (*Figure 1*) indicate pump status:

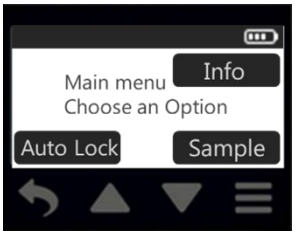
Green, flashing = Running/sampling

Red, flashing = Flow or low battery fault

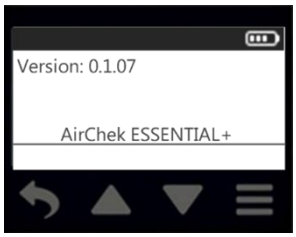
***Note**: Status LEDs will flash red/green to indicate that the pump is out of flow tolerance just before entering flow fault mode and during each auto-restart attempt while in flow fault mode.*

Main Menu Overview

Main menu options Info, Auto Lock, and Sample are described below.



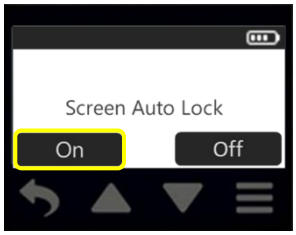
Info displays pump firmware version and name.

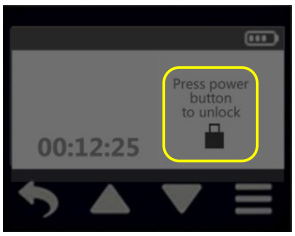


Auto Lock prevents accidental tap errors during sample runs. When activated, Auto Lock locks the pump display as soon as the pump starts sampling. To unlock and reactivate the screen, press the power on/off button on the side of the pump during sampling.

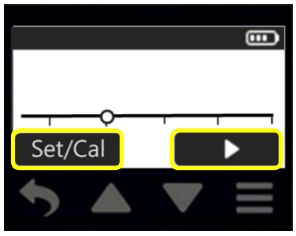
When Auto Lock is off, the screen will remain active. To *manually* lock the screen (make it inactive) at any time during sampling, press the power on/off button on the side of the pump. The pump is shipped with Auto Lock set to Off. Turn on Auto Lock as follows:

In the Auto Lock menu, touch On to activate the feature (or Off to deactivate it). When Auto Lock is activated, a lock indicator with a message to press the power button to unlock will appear on the screen during sampling (*below right*).





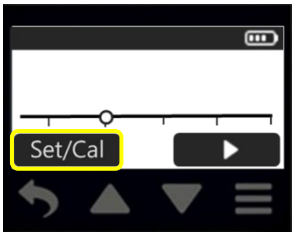
Sample displays the options to set/calibrate flow rate and start sampling.



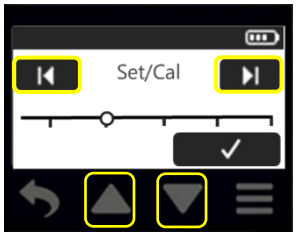
Setting/Calibrating Pump Flow Rate

Flow rate is set and calibrated through the Sample menu as described below. *Also see the procedures for setting/calibrating flow at 1 to 5 L/min and 5 to 500 ml/min, respectively.*

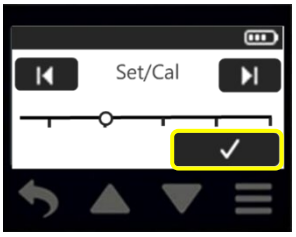
1. In Sample menu, touch Set/Cal.



2. In Set/Cal screen, touch left and right buttons to decrease or increase flow rate in approximately 0.5-L/min increments on the 1 to 5-liter scale or use up and down arrows to adjust flow in approximately 0.01-L/min increments. ***Actual flow rate is displayed on a calibrator only.***



3. Touch check mark in Set/Cal screen to save desired flow rate and return to Sample menu.



Setting/Calibrating Flow Rate from 1 to 5 L/min

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*
- *To achieve the best results, run the pump for 10 to 15 minutes before calibration.*

1. Turn on the pump.
2. Prepare the calibrator. *See calibrator instructions.*
3. Set up a calibration train with representative sample medium in line (*Figure 3*).

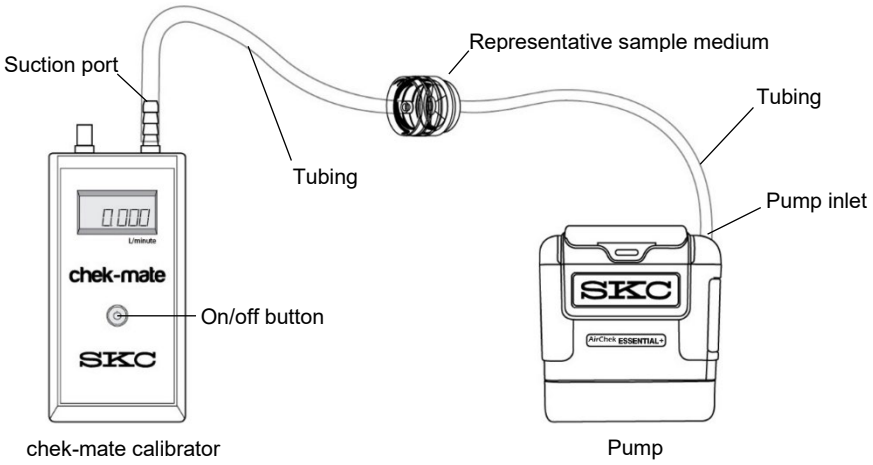
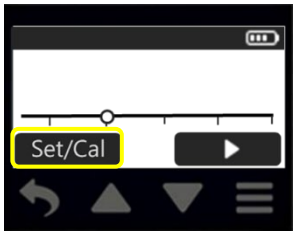
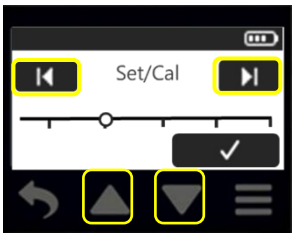


Figure 3. Calibration Train (1 to 5 L/min)

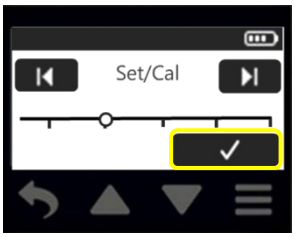
4. Set/calibrate flow rate on pump.
    a. In Sample menu, touch Set/Cal.



    b. In Set/Cal screen, touch left and right buttons to decrease or increase flow rate in 0.5-L/min increments shown on the scale or use up and down arrows on navigation panel to set values between increments. ***Actual flow rate is displayed on calibrator only***.



c. Touch check mark in Set/Cal screen to save desired flow rate and return to Sample menu.



5. Disconnect the pump from the representative sample medium and calibrator. *Go to Sampling*.

Setting/Calibrating Flow Rate from 5 to 500 ml/min

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*
- *Single-tube sampling requires the All-in-One adjustable tube holder; see the All-in-One operating instructions for details on operation.*
- *Multiple-tube sampling can be done using a Constant Pressure Controller (CPC) (Figure 5) and a Dual, Tri, or Quad Adjustable Low Flow Tube Holder accessory. See CPC and Adjustable Low Flow Tube Holder operating instructions for details on operation.*
- *Calibrate/verify pump flow rate before and after each sampling operation using the tube holder and pump to be used for sampling.*
- *To achieve the best results, run the pump for 10 to 15 minutes before calibration.*

Prepare Sorbent Tube(s)

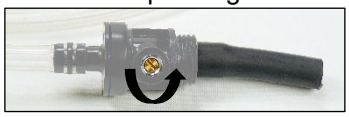
1. Determine number and type of sorbent tubes needed for pre-sample calibration and sampling.
2. Break tips off representative sorbent tubes for pre-sample calibration.
3. If performing multiple-tube sampling, label tubes.

Prepare Pump

1. Turn on the pump.
2. Prepare the calibrator per calibrator instructions.
3. Using flexible tubing, connect the calibrator outlet (suction port) to the pump inlet.
4. Set pump flow rate to the following as appropriate (*see Setting/Calibrating Pump Flow Rate*):
    - **Single-tube sampling**—1.5 L/min.
    - **Multiple-tube sampling**—the sum of all flows +15%. ***Note****: Do not exceed 500 ml/min flow rate per tube for multiple-tube sampling*
5. Disconnect tubing from the pump inlet.

Prepare All-in-One Adjustable Tube Holder (single-tube sampling)

1. On the tube holder, insert an opened representative sorbent tube (arrow on tube pointing toward the pump) into the rubber sleeve on the port. *See Figure 4*.
2. Using a small flat-head screwdriver, turn counterclockwise the brass flow adjust screw directly beneath the port.



Prepare Dual, Tri, or Quad Adjustable Low Flow Tube Holder (multiple-tube sampling)

1. On the tube holder, insert an opened representative sorbent tube (arrow on tube pointing toward the pump) into the rubber sleeve on the port. Repeat for the desired number of tube samples. *See Figure 5*. ***Note****: Place an unopened (inactive) tube in any unused port to "seal" it*.
2. Label ports on the adjustable tube holder to match labels on tubes.
3. Using a small flat-head screwdriver, turn counterclockwise the brass flow adjust screw directly beneath the port holding the first active tube to be calibrated.

Set Up Calibration Train

Connect the calibrator to the single sorbent tube or the first of multiple sorbent tubes as shown in Figures 4 and 5, respectively.

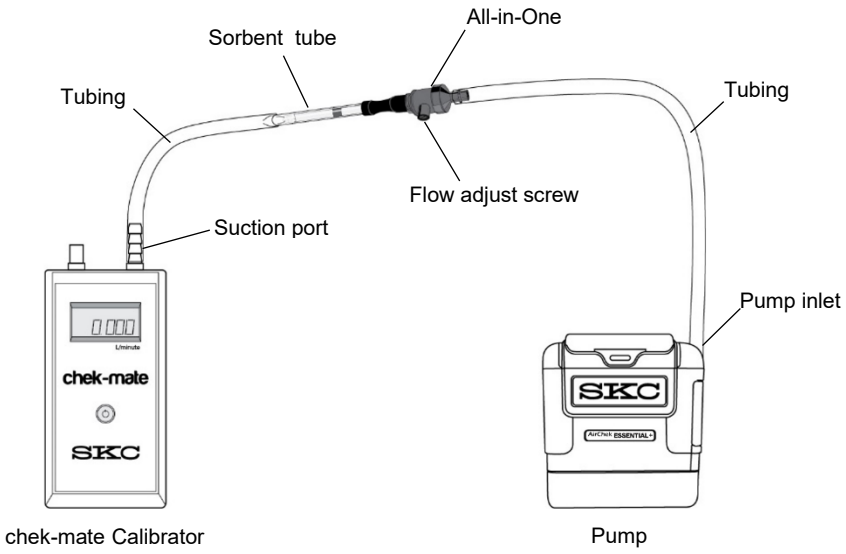


Figure 4. Calibration Train (5 to 500 ml/min) for Single Tube

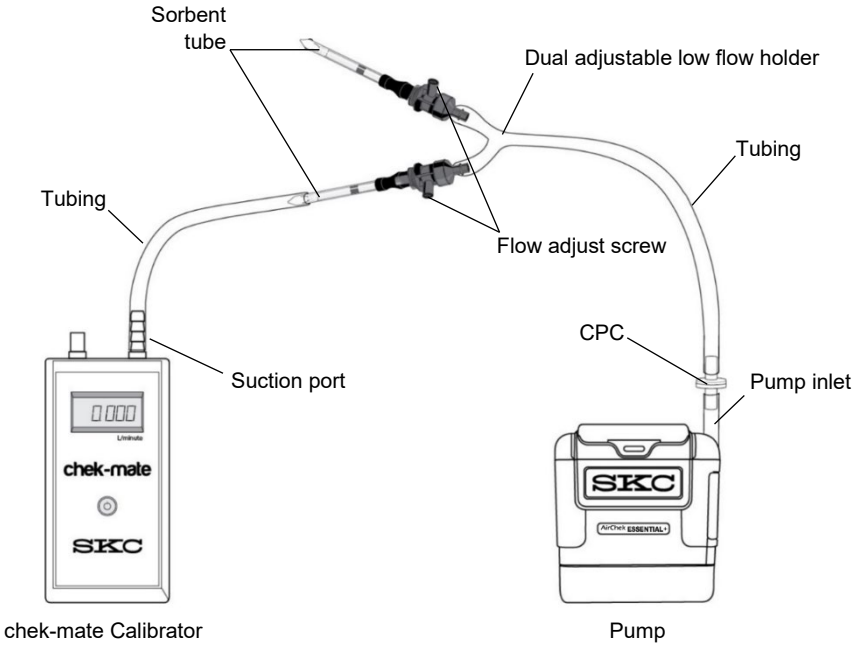


Figure 5. Calibration Train (5 to 500 ml/min) for Multiple Tubes

Calibrate Flow Rate with All-in-One (single tube, see Figure 4)

1. In the Sample menu, touch the Start button ▶ to run the pump. ***Note****: It is good practice to allow the pump to run for 10 to 15 minutes before calibrating flow rate.*
2. Using a small flat-head screwdriver, turn the flow adjust screw on the port **clockwise to decrease** flow or **counterclockwise to increase** flow until the method-specified flow rate is indicated on the calibrator.
3. Once flow is calibrated for the tube, it is recommended practice to recheck the flow rate before removing the tube. Any adjustment should be minimal.
4. Stop the pump and return to the Sample menu.
5. Disconnect the pump from the representative sample tube and calibrator. Replace representative sorbent tube with a newly opened unexposed method-specified sorbent tube to complete the sampling train. *Proceed to Sampling*.

Calibrate Flow Rate with Dual, Tri, or Quad Adjustable Low Flow Tube Holder (see Figure 5)

See appropriate adjustable flow holder instructions.

1. In the Sample menu, touch the Start button ▶ to run the pump. ***Note****: It is good practice to allow the pump to run for 10 to 15 minutes before calibrating flow rate.*
2. Using a small flat-head screwdriver, turn the brass flow adjust screw on the first active port **clockwise to decrease flow** or **counterclockwise to increase** flow until method-specified flow rate is indicated on the calibrator.
3. Remove calibrator tubing from the current tube and install it on the next active tube. Use small flat-head screwdriver to turn counterclockwise the brass flow adjust screw directly beneath the port holding the tube to be calibrated and repeat Step 2.
4. Repeat Steps 2 and 3 for each remaining active tube.
5. Stop the pump and return to the Sample menu.

6. Disconnect the pump from the representative sample tube and calibrator. Replace representative sorbent tubes with newly opened unexposed method-specified sorbent tubes to complete the sampling train. *Proceed to Sampling*.

Sampling

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before sampling.*
- *Use of an unapproved battery and/or charging cable could damage the pump and will void any warranty.*
- *Use of any device (including charging cradle) or battery pack other than Cat. No. P75718 to power the pump voids intrinsic safety certifications and any warranty.*
- *Pump can be operated from cradle.*
- *If using sample tubes as media, calibrate/verify pump flow rate before and after each sampling operation using the tube holder and pump used for sampling.*

1. After setting/calibrating flow rate, ensure that calibrator and tubing have been removed and representative method-specified sample medium used for calibration has been replaced with newly opened unexposed method-specified sample medium to complete the sampling train. *See Figure 6*.

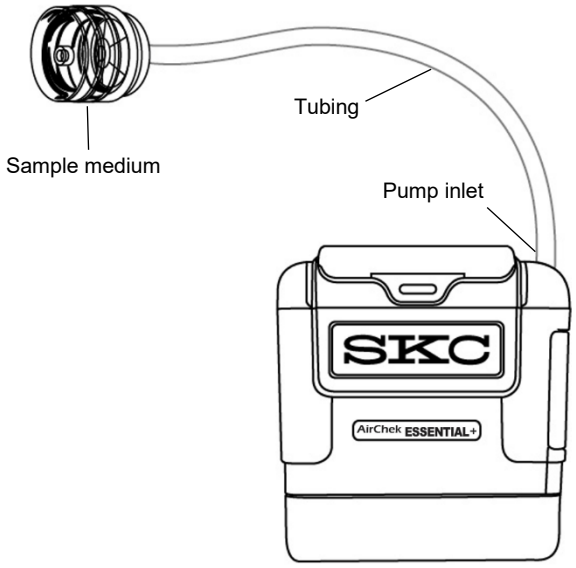
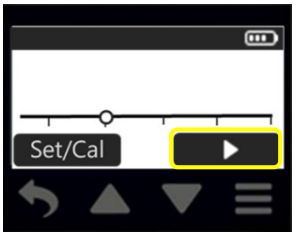
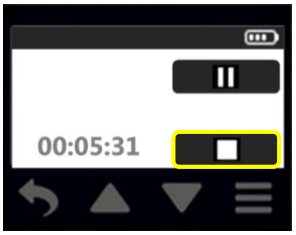


Figure 6. High Flow Sample Train

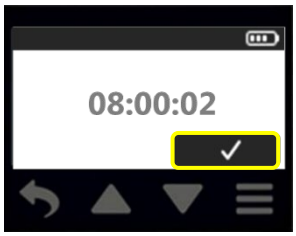
2. In Sample menu, touch the Start button.



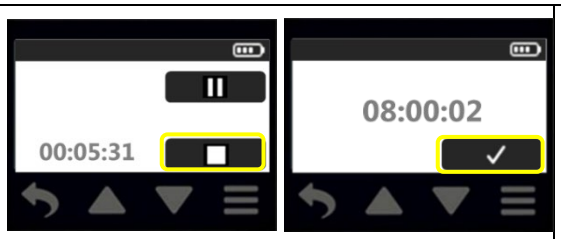
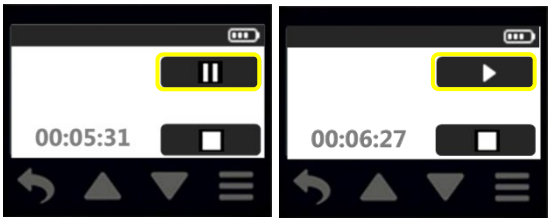
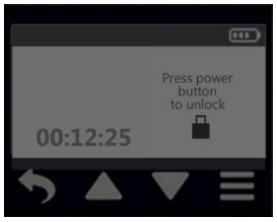
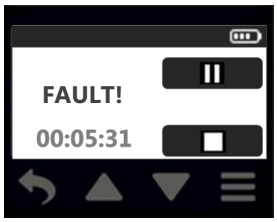
3. When the required sampling period is complete, touch the Stop button to stop sampling. ***Note:*** *To pause sampling, touch the Pause button (see Options on Pump Screen During Sampling).*



4. Total sample run time will be displayed. Touch the check mark to reset accumulated run time.



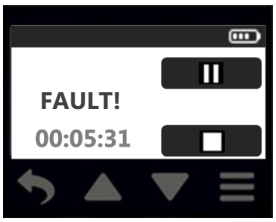
Options on Pump Screen During Sampling

	**Stop sampling.** Touch the Stop button to stop sampling. Touch check mark to reset accumulated run time display.
	**Pause sampling.** Touch the Pause button to pause sampling and retain accumulated run time display. Touch the Start button to resume sampling and run time accumulation.
	**Unlock touch screen *(AutoLock is on)*.** Press the power on/off button on the side of the pump *(see Figure 1)*. This will unlock/activate and undim the touch screen. ***Note:*** *When Auto Lock is off, press the power button to lock touch screen while sampling and this screen will be displayed.*
	**Fault.** A fault may occur when there is restriction in airflow (e.g., kinked tubing) that remains uncorrected and the pump can no longer compensate flow, or when battery voltage is too low. *See Fault Mode and Display for details on pump operation during flow fault*.

Fault Mode and Display

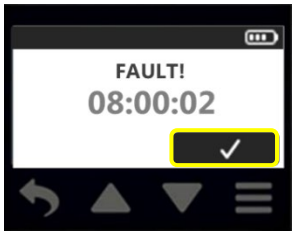
During a sample run, overloaded sampled media or kinked tubing can restrict airflow and cause back pressure to build to a point at which the pump can no longer compensate flow within ± 5%. This also may happen when battery voltage is too low to maintain set flow. If this condition is sustained for 3 to 10 seconds, the pump will go into fault mode as follows:

1. The pump stops sampling and status LEDs on the pump flash red. Elapsed time stops and "FAULT!" is displayed on the screen.



2. After 20 seconds in fault, the pump will attempt to restart up to 5 times.
    a. If full airflow is restored during the restart attempts, the pump will continue the sample run.
    b. If full airflow is **not** restored during 5 faults and four restart attempts within 5 minutes, the pump will end the sample run. The LEDs will flash red with decreasing frequency.

3. The fault screen below will be displayed. Touch the check mark to clear the flow fault and return to the Sample menu.



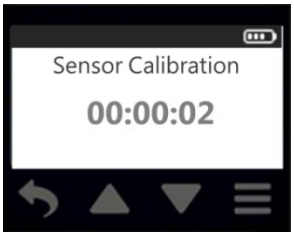
Replacing the Battery Pack

Ensure that pump is turned off before removing the battery pack and that no tubing or media are attached to the pump.

1. Turn the pump off by pressing the on/off button.
2. Remove the existing battery pack.
    a. Use a 2.5-mm hex driver (Allen wrench) to loosen two screws on the bottom of the battery pack housing.
    b. Pull the battery pack housing away from the pump case.
    c. If replacing the battery pack with a new Cat. No. P75718, dispose of the used battery promptly.

Do not disassemble the battery pack. Do not dispose of in fire. Dispose of used batteries promptly according to all state and local recycling of waste regulations.

3. Install a new battery pack or reinstall the existing battery pack.
    a. Align the battery pack with the bottom of the pump case. ***Note****: The connector on top of the battery pack should align with the protruding power control board contacts on the bottom of the pump case*.
    b. Press the two parts together until snug. ***Note****: When the battery pack is attached, the pump screen will display a 20-second countdown as the zero setting of the flow sensor is performed.*



    c. Use a 2.5-mm hex driver (Allen wrench) to tighten two screws on the bottom of the battery pack housing. Tighten the screws in an alternating fashion.
    d. Charge the new battery pack completely before use; if reinstalling the existing battery pack, ensure that it is charged to at least 25% (battery status icon upon startup shows two bars). *See Charging the Battery Pack*.

Replacing the Screen Cover

1. Remove the two screws from the top of the screen cover mounting block.
2. Lift off the screen cover and mounting block.
3. Align and press-fit the mounting block onto the new screen cover posts (i.e., with the underside of the mounting block facing up and its straight edge facing away from the cover). Rotate the mounting block away from the screen cover until it is stopped by the inside edge of the screen cover.
4. Align the screen cover/mounting block with the holes in the top of the belt clip/top pump case.
5. Gently insert the two screws through the mounting block into the belt clip. Tighten until snug.
6. Ensure that the screen cover closes properly.

Replacing the Belt Clip

1. Remove the screen cover.
    a. Remove the two screws from the top of the screen mounting block.
    b. Lift off the screen cover and mounting block. ***Note****: Do not remove the two lower hex nuts from the main case.*
2. Remove the screw from the bottom of the belt clip and pull the screw through the opening in the clip.
3. Lift the belt clip away from the pump. Ensure that the hex nut in the top of the case does not fall out.
4. Push the new belt clip into place until it fits snugly.
5. Gently insert the belt clip screw through the opening in the belt clip and into the pump case. Tighten the screw until engaged. Do not tighten completely.
6. Replace the screen cover.
    a. Place the screen cover and mounting block so that the two holes are aligned with the holes in the top of the belt clip. Insert the two screws into the mounting block and tighten until snug.
    b. Ensure that the screen cover closes properly.
7. Tighten the screw under the belt clip until snug.

Replacing the Inlet Housing and/or Inlet Filter

1. Remove the four screws from the inlet housing.
1. Pull the inlet housing away from the pump.
2. Remove the O-ring and filter.
3. Insert the new or existing filter and O-ring into the inlet recess. Ensure that the O-ring is fully flat.
4. Align the new or existing inlet housing with the inlet recess.
5. Insert the four screws into the inlet housing. Tighten the screws only until the gap between the inlet housing and pump is closed.

TROUBLESHOOTING

Issue	Possible Solutions
The pump is not responding to touch or the pump screen displays uncommon characters.	Remove and reinstall the battery (*see Replacing the Battery Pack*). If these problems persist, contact SKC.

Pump Service

Pumps under warranty should be sent to SKC Inc. for servicing. See Limited Warranty and Return Policy.

User may replace external components such as the inlet filter, battery, screen protector, and/or belt clip. Service must be performed by SKC to maintain performance and intrinsic safety rating. Warranty is void if pumping compartment is opened by user.

ACCESSORIES/REPLACEMENT PARTS

Accessories	**Cat. No.**
Lite Charging Cradle, *requires power supply Cat. No. 220-600 or 220-851, see below*	220-850
Single Cradle Power Supply, for use with one charging cradle, 100-240 V	220-600
Multi Cradle Power Supply and Splitter for Lite Cradle, *for use with 1 to 5 Lite Cradles*	220-851
Low Flow (5 to 500 ml/min) Kit includes All-in-One adjustable tube holder and Type A protective tube cover	210-500
Constant Pressure Controller for multiple-tube sampling	224-26-CPC
Protective Pouch, nylon, with adjustable waist belt and shoulder strap, black	224-911
Medium Flow chek-mate Calibrator, 0.50 to 5 L/min, includes 9-volt battery	
with NIST standard traceable calibration certificate	375-0550N
with ISO standard traceable calibration certificate	375-0550S
with UK standard traceable calibration certificate	375-0550

Replacement Parts	**Cat. No.**
Replacement Battery Pack, Li-Ion*	P75718
Belt Clip	P51824
Inlet	P20423
Inlet Filter/O-rings, pk/3	P4001
Screen Cover	P20422

***Li-Ion Battery Testing and Shipment**
Rechargeable lithium-ion (Li-Ion) batteries for use with SKC sample pumps have been tested in accordance with the UN Manual and are proven to meet requirements of each test in the *UN Manual of Tests and Criteria*, Part III, subsection 38.3. The batteries are rated below 100 watt-hours (Wh).

AirChek Essential+ pumps contain Li-Ion batteries and are subject to special shipping regulations. Consult with your carrier for more information on Lithium Battery Shipping Regulations UN 3480 and UN 3481 or visit www.skcinc.com/knowledgecenter.

Use only SKC-approved parts to ensure reliable performance and to maintain the UL Listing for intrinsic safety. Failure to do so voids any warranty.

Use of a repaired or rebuilt battery pack VOIDS ANY WARRANTY.

SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to skcinc.com/warranty.

APPENDIX: PERFORMANCE PROFILE

Flow range	Constant flow from 1000 to 5000 ml/min (5 to 500 ml/min requires low flow holder)
Compensation range	5000 ml/min at 20 inches water back pressure 4000 ml/min at 30 inches water back pressure 3000 ml/min at 40 inches water back pressure 2000 ml/min at 50 inches water back pressure 1000 ml/min at 60 inches water back pressure
Flow control system	Isothermal, corrects for changes in back pressure, temperature, and atmospheric pressure
Flow fault/Auto-restart	After 3 to 10 seconds of restricted flow, pump stops sampling, elapsed time stops, status LEDs flash red, and pump displays fault icon. After 20 seconds in fault, auto-restart is attempted up to 5 times unless full airflow is restored prior to that. If full airflow is not corrected during 5 restart attempts within 5 minutes, the pump ends the run.
Power	Removable rechargeable lithium-ion (Li-Ion), 7.4 V, 2.6 Ah, 19.2 Wh or AC using cradle
Run time	40+ hours at 2000 ml/min* 15+ hours at 5000 ml/min* Indefinite run from charging cradle
Charging method	Cradle, available as a single unit using Lite Charging Cradle Cat. No. 220-850 with Single Cradle Power Supply Cat. No. 220-600; connectable up to 5 units using Multi Cradle Power Supply and Splitter for Lite Cradle Cat. No. 220-851
Charging time (*varies with battery capacity and level of discharge*)	Approximately 3 hours
Accuracy	**Flow control:** ± 5% of set-point after calibration to desired flow **Atmospheric pressure:** ± 0.3 inHg **Temperature:** ± 1.0 C
Temperature ranges	**Operating:** 32 to 104 F (0 to 40 C) **Charging:** 32 to 113 F (0 to 45 C) **Storage:** -4 to 113 F (-20 to 45 C)
Humidity ranges	**Operating:** ≤ 95% RH, non-condensing **Storage:** ≤ 95% RH, non-condensing
Altitude	Corrects flow for changes in temperature (32 to 104 F [0 to 40 C]) and ambient pressure up to 15,000 feet (4572 meters) above and down to 4500 feet (1372 meters) below sea level
Display/parameters	High-contrast backlit LCD/ battery status and elapsed run time
User interface	Eight-area capacitive touch screen with auto lock option
Status LEDs	Dual LED, blinking green = sampling pump, blinking red = flow fault
Sound level	Average 51.7 dB at 3-ft (1-m) distance using a 37-mm, 0.8-µm MCE filter cassette
Tubing	Requires ¼-inch ID tubing
Dimensions	4.1 x 3.7 x 2.8 in (10.4 x 9.4 x 7.1 cm)
Weight	19.4 oz
Certifications/Markings	• Intrinsic safety (SKC Cat. No. 220-3100 operated with SKC Battery Pack P75718) Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III, T4; Class I, Zone 0, AExia IIC T4 Ga; Exia IIC T4 Ga; -20°C ≤ Ta ≤ 45°C; Ex II 1G Exia IIC T4 Ga; IECEx UL 19.0100; DEMKO 19ATEX 2288; UL22UKEX2351; CE 0539; UKCA 0843 • Designed to meet ISO 13137:2022 c UL us LISTED E62011
RoHS	Compliant
Case material	Polycarbonate with rubberized anti-static overmolding
Features	On-screen battery status display, ergonomic case design, secure clip, cradle for charging, ultra-quiet operation
Media	Use to sample with sorbent tubes, filters, size-selective particulate samplers, and impingers
Warranty	1-year limited warranty

**Tested using 37-mm 0.8-µm MCE filter with new pump and battery. Pump performance may vary.*