AirChek® XR5000 Sample Pump
Cat. No. 210-5000
Operating Instructions

863 Valley View Road, Eighty Four, PA 15330 USA • Tel: 724-941-9701 • e-mail: skctech@skcinc.com • www.skcinc.com

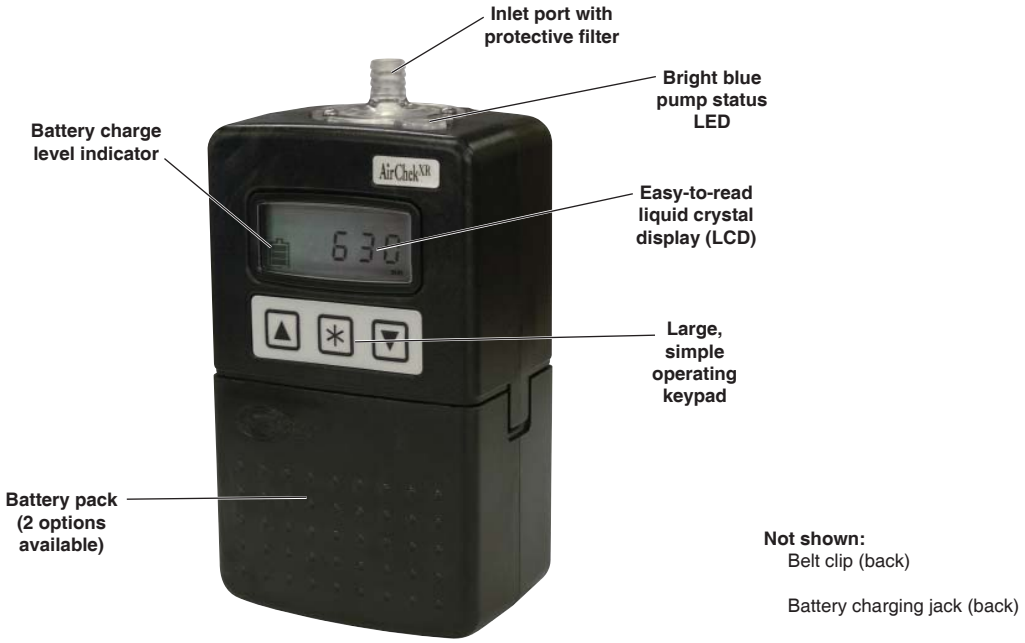


Figure 1. *AirChek XR5000 Air Sample Pump*

Introduction

Description

The SKC AirChek XR5000 Sample Pump *(Figure 1)* is a constant flow (5 to 5000 ml/min) air sampler suitable for low flow gas/vapor or high flow particulate sampling.

Checking Pump/Kit Contents

Use the table below 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 724-941-9701.

If You Ordered Cat. No.	Your Package Should Contain
210-5001	AirChek XR5000 Sample Pump with high-power lithium-ion (Li-Ion) battery and screwdriver set
210-5002	AirChek XR5000 Sample Pump with standard Li-Ion battery and screwdriver set
210-5001K	Single Pump Kit includes pump with high-power Li-Ion battery, 100-240V single charger, and cassette holder, in a soft-side nylon carry case
210-5002K	Single Pump Kit includes pump with standard Li-Ion battery, 100-240V single charger, and cassette holder, in a soft-side nylon carry case

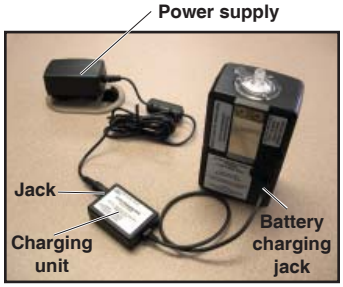
Required Equipment

- ☑ **1/4-inch ID (3/8-inch OD) Tygon® tubing**
- ☑ **Charger for Li-Ion battery-powered pump**
- ☑ **Low flow accessories** if sampling at 5 to 500 ml/min. *See Accessories.*

Getting Started

Charge the Lithium-Ion Battery Pack

- *Completely charge a new battery pack before operating the pump. It may be necessary to charge the battery a few times before maximum battery capacity is achieved.*
- *Intrinsic safety circuitry inside the battery causes the pump to self-discharge during storage. Charge battery completely before calibration and sampling to achieve optimum pump operation.*
- *After charging the battery pack, it is good practice to run the pump for approximately 5 minutes before calibrating. This ensures the battery is in more steady-state conditions and improves the agreement in pre and post-sampling calibrations.*
- *The battery pack may be kept on SKC-approved Li-Ion battery chargers for an indefinite time.*



AirChek XR5000 charging train with single charger (a five-station charger is available, see Accessories)

1. For a complete charge, ensure the pump is **not** running. Insert plug on charging unit into the battery charging jack on back of pump. Ensure plug is oriented so that the arrow on the plug is facing upward.

Ensure proper orientation of charging cable before plugging it into the charging jack. Improper orientation/contact will short circuit the battery and voids any warranty.

Short circuiting the battery pack will render it immediately inoperative.

2. Insert plug on power supply into jack on charging unit.

3. Pull locking tab to side and insert appropriate wall plug into power supply. Release locking tab. Plug power supply into a wall outlet.

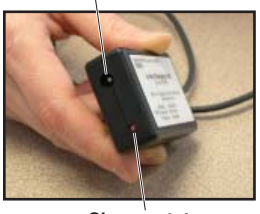
4. The standard 2-cell Li-Ion battery pack will recharge in approximately 4 hours. The high-power 4-cell Li-Ion battery pack will recharge in approximately 8 hours. Run pump for 5 minutes after charging is complete.


Interchangeable wall plugs insert into power supply.

Reading the Charging Status LED on the Single Charger

The Li-Ion Charging Unit (Cat. No. P22300) indicates battery charge status via an LED on the unit that blinks in specific patterns. Observe the LED steadily for > 5 seconds to read charge status *(see below)*.

LED Action	Charge Status
ON ✸ steady	Charge in progress
ON ✸ 2 sec, OFF ○ .25 sec, ON ✸ 2 sec (Repeats)	Approximately 80% charged
OFF ○ 2 sec, ON ✸ .25 sec, OFF ○ 2 sec (Repeats)	Charge completed



Determining Battery Charge

Three bars indicate a full charge (normally appears after charging), approximately 75 to 100%.

Two bars indicate the battery is charged enough to operate the pump, approximately 25 to 75%.

One bar indicates battery charge is low (charge battery), approximately 1 to 25%.

No bars indicate that low battery fault is imminent.

Low Battery Fault

No bars and a flashing outline indicate a low battery fault (pump will go into Hold and go to sleep after 15 seconds in low battery fault). Accumulated run time will be retained.

Notes and Cautions

- Do not charge or operate pump from charger in hazardous locations.
- Use only the charger and battery packs designed for the AirChek XR5000 pump to ensure reliable performance. Failure to do so will void any warranty.
- For safe operation in hazardous locations, ensure the pump label contains the c UL us LISTED logo and the battery pack label contains Cat. No. P85004 or P85002. Use of any other battery pack or device to power the pump voids the UL Listing for intrinsic safety.
- Tampering with the battery pack or using a repaired or rebuilt battery pack voids any warranty and UL Listing for intrinsic safety.
- Do not open, disassemble, short circuit, crush, incinerate, or expose the battery to fire or high temperatures.
- Use only the SKC-approved charger for this pump. Use of an unapproved charger may damage the battery and pump and voids any warranty.
- Failure to follow warnings and cautions voids any warranty.

See http://www.skcinc.com/instructions/1756.pdf for more information on SKC pump battery packs.

How to Use the Keypad

The AirChek XR5000 is operated by pressing key sequences on the keypad located on the front of the pump case *(see right and table below)*.

Key	*Action*
✹	Scrolls through parameters in user setup functions
▲	Increases flow rate, timed run, and run delay time
▼	Decreases flow rate, timed run, and run delay time

Key Sequence	*Action/Result*
▲✹	Press keys individually.
[▲▼]	Press simultaneously to toggle between Hold and Run modes and to exit user setup functions.
✹▲▼✹	Security code. With pump in a non-running state (no flashing blue LED), press to access user setup functions.



Turn Pump Power On/Off

Turn on:

- Press and hold ✹ until display shows "ON."
- Press [▲▼] to run the pump or to place a running pump in Hold. A flashing blue LED on top of the pump indicates pump is running or that there is a run delay programmed into the pump.



Turn off:

- Manual Off (Sleep mode): With pump in a non-running state (no flashing blue LED), press and hold ✹ until a countdown from 3 to 1 appears on the LCD and pump shuts off. Manual Off will operate even when keypad is locked.
- Auto Off (Sleep mode): Turns off a non-running pump (no flashing blue LED) after five minutes of inactivity.



Lock the Keypad

- *While the keypad is locked, the ✹ key will still operate to allow manual pump shutoff in a non-running state (no flashing blue LED).*
- *A locked keypad will remain locked until the user unlocks it. Turning the pump off and on does not affect keypad lock status.*

Locking: In any mode, press ▼ **5** times **quickly**. A flashing "L" will appear in the lower right corner of the display.



Unlocking: Press ▼ **5** times **quickly**. The flashing "L" will disappear from the lower right corner of the display. The keypad may be operated normally. If the "L" is still displayed, *see Troubleshooting*.

Access User Setup Functions

User setup functions cannot be accessed while the keypad is locked.

Entering Functions: With pump in a non-running state (no flashing blue LED), press ✹▲▼✹.

Exiting Functions: Press [▲▼] to exit user setup functions. Pump is ready to run.

User Setup Functions

User setup functions are listed below in the order in which they are displayed. ***Note:*** *the CLr function for clearing accumulated run time is only available when accumulated run time exists.*

No Accumulated Run Time	Accumulated Run Time
	CLr
ADJ FLOW	ADJ FLOW
Set TIMED RUN	Set TIMED RUN
Set RUN DELAY	Set RUN DELAY

Clear Accumulated Run Time

- *CLr will not cancel Timed Run or Run Delay time settings (see Cancel a Timed Run and/or Run Delay).*
- *Changing the timed run and/or run delay settings in user setup functions will automatically clear accumulated run time.*
- *Changing the flow rate in user setup functions will not clear accumulated run time.*

1. With the pump in a non-running state (no flashing blue LED), press ✷▲▼✷.
2. Press [▲▼] at CLr display to clear accumulated run time. The pump is ready to run.



Set Flow Rate

1. With pump in a non-running state (no flashing blue LED), press ✷▲▼✷.
2. Connect the pump inlet to a calibrator.
3. Press ✷ until "ADJ" and "Flow" flash on the display.
4. Press ▲ to increase or ▼ to decrease flow. Dashed lines will move up and down on the LCD to indicate direction of adjustment. **Flow rate will not display on the pump LCD.** Observe the calibrator for flow reading.
5. Press [▲▼] to accept the flow setting and to exit user setup functions.



Set a Timed Run

Program the AirChek XR5000 from its keypad to run from 1 to 9999 minutes.

With pump in a non-running state (no flashing blue LED):

1. Press ✷▲▼✷ to enter user setup functions.
2. Press ✷ until a flashing "Set Timed Run" and "min" appear on the display.
3. Press ▲ to increase or ▼ to decrease minutes.
4. Press [▲▼] to accept timed run setting and to exit user setup functions. The setting will appear on the display and the pump will be ready to run.
5. Press [▲▼] to run the pump.



During a timed run:

a. The blue LED on top of the pump case will flash. "Timed Run Remaining" will display and the minutes will count down on the LCD.
b. Accumulated run time can be displayed by pressing and holding ▲.
c. Run can be paused (Hold) by pressing [▲▼]. The time remaining and accumulated run time displays will freeze. Run can be resumed by pressing [▲▼]. Time remaining and cumulative run time will resume.
d. At the end of the run, the pump will stop and "Timed Run Remaining" and "0" will be displayed. To display accumulated run time, press and hold ▲.
e. To return to "Timed Run" display, press [▲▼]. This will also clear accumulated run time.



Note: ***If pump goes to sleep following the run*** *and is awakened, the pump will display "Timed Run Remaining" and "0." Accumulated run time from the run remains and can be displayed by pressing and holding ▲.*

Tip Pressing [▲▼] after a completed run automatically clears accumulated run time.

Set a Run Delay with Continuous Run

Program the AirChek XR5000 from its keypad to automatically start a sample run after a specified period of time (1 to 9999 minutes) has elapsed.

With pump in a non-running state (no flashing blue LED):

1. Press ✹▲▼✹ to enter user setup functions.
2. Press ✹ until a flashing "Set Run Delay" and "min" appear on the display.
3. Press ▲ to increase or ▼ to decrease minutes.
4. Press [▲▼] to accept run delay setting and to exit user setup functions. Run delay time will display on the LCD and the pump will be ready to start run delay.
5. Press [▲▼] to activate the pump.



During a run delay with continuous run:

a. The blue LED on top of the pump case will flash during the run delay even though the pump is not running.
b. Run delay time remaining will count down in minutes and display on the LCD.
c. Once the run delay time has elapsed, the pump will start running. Accumulated run time will count up in minutes.
d. Run can be paused (Hold) by pressing [▲▼]. The accumulated run time display will freeze. Run can be resumed by pressing [▲▼]. Accumulated run time display will resume.
e. Once the run is complete, stop the pump by pressing [▲▼]. Accumulated run time will be displayed.



Note: ***If pump goes to sleep following the continuous run*** *and is awakened, it will display accumulated run time.*

Set a Run Delay with Timed Run

With pump in a non-running state (no flashing blue LED):

1. Press ✹▲▼✹ to enter user setup functions.
2. Press ✹ until flashing "Set Timed Run" and "min" appear on the display.
3. Press ▲ to increase or ▼ to decrease minutes (1 to 9999 minutes).
4. Press ✹ to scroll to a flashing "Set Run Delay" and "min."
5. Press ▲ to increase or ▼ to decrease minutes (1 to 9999 minutes).
6. Press [▲▼] to accept run delay and timed run settings and to exit user setup functions. The run delay setting will appear on the LCD and the pump will be ready to start run delay.
7. Press [▲▼] to activate the pump.





During a run delay with timed run:

a. The blue LED on top of the pump case will flash during the run delay even though the pump is not running.
b. Run delay time remaining will count down in minutes and display on the LCD.
c. Once the run delay time has elapsed, the pump will start running. "Timed Run Remaining" will display and count down in minutes on the LCD.
d. Accumulated run time can be displayed by pressing and holding ▲.
e. Run can be paused (Hold) by pressing [▲▼]. The time remaining and accumulated run time displays will freeze. Run can be resumed by pressing [▲▼]. Time remaining and cumulative run time will resume
f. At the end of the run, the pump will stop and "Timed Run Remaining" and "0" will display. To display accumulated run time, press and hold ▲.
g. To return to "Timed Run" display, press [▲▼]. This will also clear accumulated run time.





Note: ***If pump goes to sleep following the timed run*** *and is awakened, it will display "Timed Run Remaining" and "0." Accumulated run time from the run remains and can be displayed by pressing and holding* ▲.

Tips

- When setting a timed run or run delay with a large number of minutes in user setup functions, press ✹ simultaneously with ▲ or ▼. This activates the speed count feature that scrolls through timed run or run delay minutes in increments of 100.
- Pressing [▲▼] after a completed run automatically clears accumulated run time.

Cancel a Timed Run and/or Run Delay

- *Selecting CLr in user setup functions after a sample run will clear accumulated run time only. It will not clear Timed Run or Run Delay time settings.*

With pump in a non-running state (no flashing blue LED):

1. Press ✹▲▼✹ to enter user setup functions.
2. Press ✹ until flashing "Set Timed Run" and "min" appear on the display.
3. Press ▼ until time displays as 0.
4. Repeat for Run Delay if needed.
5. Press [▲▼] to exit user setup functions. Pump will be ready to run.



Operation

High Flow Applications (1 to 5 L/min)

Set/Calibrate Flow Rate

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*

1. Ensure that battery is fully charged and that pump has run for 5 minutes before calibrating.

2. Prepare the calibrator. *See calibrator instructions*.



Calibration train with filter cassette

3. Set up a calibration train *(see above)*: Using flexible tubing, connect the calibrator outlet (suction port) to the representative sample medium inlet. Using 1/4-inch Tygon tubing, connect the sample medium outlet to the pump inlet.

4. With pump in a non-running state (no flashing blue LED), set the desired pump flow rate as follows:
   a. Press ✹▲▼✹ to enter user setup functions.
   b. Press ✹ until "ADJ" and "Flow" flash on display. Press ▲ to increase flow. Press ▼ to decrease flow (dashed lines will move up or down on the display to indicate graphically the direction of the adjustment) until the calibrator indicates the method-specified flow rate. **Flow rate will not display on pump LCD. Observe the calibrator to determine flow rate.** Once the desired flow rate is indicated on the calibrator (within ± 5%), press [▲▼] to accept flow setting and to exit user setup functions. Take a minimum of three readings and record the average flow rate, as per OSHA/NIOSH instructions. The pump is ready to run.



   - *Changing the flow rate in user setup functions will not clear accumulated run time.*
   - *Changing the timed run and/or run delay settings in user setup functions will automatically clear accumulated run time.*

5. Disconnect the calibrator and flexible tubing from the representative sample medium and proceed to *Set Up/Sample*.

Set Up/Sample

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Protect sample pump from weather when sampling outdoors.*
- *Use of any device or battery pack other than Cat. Nos. P85004 and P84002 to power the pump voids the UL Listing for intrinsic safety.*
- *Charge pump battery completely before calibration and sampling.*



1. Replace sample medium with new unexposed medium for sample collection.
2. Place the sample medium where appropriate for sampling. **For personal sampling,** clip the sample collection medium to the worker in the breathing zone and the pump to the worker's belt using the belt clip.

When using an impinger, place an in-line trap between the pump and impinger to prevent fumes from accidentally being drawn into the sampler. Failure to use an appropriate in-line trap during impinger sampling voids any warranty.

3. Start a continuous or timed sample run by pressing [▲▼]. Record start time and other pertinent information.

   - *Sampling will start automatically if a run delay is set and initiated. Sampling will stop automatically if a timed run is set and initiated.*
   - *For automatic start and stop, set and initiate both a run delay **and** a timed run.*

4. Sample for the time specified in the method used. Accumulated run time will display on the LCD.



5. To stop a sample run, press [▲▼]. This places the pump in Hold. Record stop time and other pertinent information.
   a. To resume sample run without clearing accumulated run time, press [▲▼].
   b. To clear accumulated run time, place pump in Hold, press ✷▲▼✷ to enter user setup functions, and press [▲▼] when CLr displays.

Possible Displays During Sampling



Flow fault during continuous run

Flow Fault — If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters flow fault. During flow fault, the fault icon displays on the LCD and flashes during the length of the fault, the pump enters Hold mode, and the accumulated run time display is retained. The pump will restart in 15 seconds and try to continue sampling. If the flow remains restricted, the pump will return to flow fault. Auto-restart is attempted every 15 seconds up to 5 times. Flow fault time is not added to accumulated run time.

To clear a flow fault and the flow fault icon, determine the cause of the fault, remedy the fault cause, and press [▲▼] to remove the icon from the LCD and restart the pump.

Note: *A low battery fault may occur instead of a flow fault when there is a low battery charge at the time of the fault, excessive back pressure, and/or when there is a very short distance between the restriction and the pump inlet (e.g., finger fault versus pinched tubing).* ***The flow fault icon will not appear and auto-restart will not be activated under these conditions.*** *A low battery fault icon will appear instead and the pump will go to Sleep.*

If pump goes to Sleep while in flow fault, the flow fault icon may remain displayed on the LCD when the pump is subsequently turned on. To remove the icon from the LCD, place the pump in Hold, press ✷▲▼✷ to enter user setup functions, and press [▲▼] when "CLr" appears.

6. Cap the sample and send it with blanks and pertinent sampling information to a laboratory for analysis.

7. Verify the flow.
   a. Turn on the pump and reinstate the calibration train and sampling medium.
   b. Take three readings and record the average value as the post-sample flow rate. **Do not adjust the pump flow rate during this step.**
   c. Compare the pre and post-sample flow rates. Note in sampling documentation if the values differ by more than ± 5%.

Low Flow Applications (5 to 500 ml/min)

- *Single-tube sampling requires the All-in-One low flow adjustable tube holder; see the operating instructions for the All-in-One for details on its operation.*
- *Multiple-tube sampling requires a Constant Pressure Controller (CPC) and a Dual, Tri, or Quad Adjustable Low Flow Tube Holder accessory; see the operating instructions for the CPC and Adjustable Low Flow Tube Holder for details on their operation.*

Using the All-in-One Adjustable Tube Holder

Set/Calibrate Flow Rate for Single Tube

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*
- *Calibrate before each sampling operation using the tube holder and pump to be used for sampling.*
- *The flow rate through the pump is set first and then the flow rate through the sorbent tube is calibrated.*
- *Two small inlet holes on the bottom of the built-in CPC of the All-in-One can become blocked. Periodically inspect and, if needed, clean with a small pick and blow particles away with a puff of air.*

Pump Flow Rate

1. Ensure that battery is fully charged and that pump has run for 5 minutes before calibrating.

2. Prepare the calibrator *(see calibrator instructions).* Using flexible tubing, connect the calibrator outlet (suction port) to the pump inlet.

3. With the pump in a non-running state (no flashing blue LED), set the pump flow rate to 1.5 L/min as follows:
   a. Press ✹▲▼✹ to enter user setup functions.
   b. Press ✹ until "ADJ" and "Flow" flash on display. Press ▲ to increase flow. Press ▼ to decrease flow (dashed lines will move up or down on the display to indicate graphically the direction of the adjustment) until calibrator indicates the method-specified flow rate. **Flow rate will not display on pump LCD. Observe the calibrator to determine flow rate.** Once the desired flow rate is indicated on the calibrator (within ± 5%), press [▲▼] to accept flow setting and to exit user setup functions. Take a minimum of three readings and record the average flow rate as per OSHA/NIOSH instructions.



   - *Changing the flow rate in user setup functions will not clear accumulated run time.*
   - *Changing the timed run and/or run delay settings in user setup functions will automatically clear accumulated run time.*

4. Remove tubing from the pump inlet.

Flow Rate Through Sorbent Tube

1. Attach the Tygon tubing from the All-in-One to the pump inlet. *See right.* Break tips off the representative sorbent tube and insert it into the rubber sleeve on the holder (arrow on tube pointing toward pump). Ensure that the sorbent tube fits snugly in the rubber sleeve prior to sampling to avoid any air leakage. Two sleeves, each a different inner diameter, are supplied with the All-in-One.



Calibration train with All-in-One

If the pump flow faults shortly after attaching the tube holder, check that the needle valve on the All-in-One is open by using a small flat-head screwdriver to turn the flow adjust screw on the holder slightly counterclockwise. If the flow fault continues, check that the two small holes on the bottom of the built-in CPC are not blocked.

2. Using flexible tubing, connect the exposed end of the sorbent tube to the calibrator outlet (suction port).

3. Adjust the flow rate through the sorbent tube using a small flat-head screwdriver to turn the flow adjust screw on the holder *(see right)* **counterclockwise** to increase flow or **clockwise** to decrease flow until the calibrator indicates the method-specified flow rate. **Do not adjust flow rate on the pump.**



Turn screw on holder to adjust flow.

Do not shut off flow completely with flow adjust screw or use an oversize screwdriver to adjust flow—valve or thread seat damage may result.

4. When calibration is complete, disconnect the calibrator and tubing from the sorbent tube inlet.

Set Up/Sample with Single Tube

- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*
- *Protect sample pump from weather when sampling outdoors.*
- *Use of any device or battery pack other than P85004 and P84002 to power the pump voids the UL Listing for intrinsic safety.*

1. Replace the representative sorbent tube used for calibration with new unexposed sorbent tube for sample collection. ***Note:*** *Ensure that sorbent tube fits snugly in rubber sleeve before sampling to avoid any air leakage. Two sleeves, each a different inner diameter (ID), are supplied with the All-in-One.*

2. Place the tube cover over the tube and thread it into place on the All-in-One until secure.

3. Place the sorbent tube where appropriate for sampling. For **personal sampling,** clip the All-in-One to the worker in the breathing zone and the pump to the worker's belt using the belt clip.

4. Start a continuous or timed sample run by pressing [▲▼]. Record start time and other pertinent information.

   - *Sampling will start automatically if a run delay is set and initiated. Sampling will stop automatically if a timed run is set and initiated.*
   - *For automatic start and stop, set and initiate both a run delay and a timed run.*

5. Sample for the time specified in the method used. Accumulated run time will display on the LCD.



6. To stop a sample run, press [▲▼]. This places the pump in Hold. Record stop time and other pertinent information.
   a. To resume sample run without clearing accumulated run time, press [▲▼].
   b. To clear accumulated run time, ensure the pump is in Hold, press ✷▲▼✷ to enter user setup functions, and press [▲▼] when "CLr" displays.

Possible Displays During Sampling

Flow Fault — If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters flow fault. During flow fault, the fault icon displays on the LCD and flashes during the length of the fault, the pump enters Hold mode, and the accumulated run time display is retained. The pump will restart in 15 seconds and try to continue sampling. If the flow remains restricted, the pump will return to flow fault. Auto-restart is attempted every 15 seconds up to 5 times. Flow fault time is not added to accumulated run time.



Flow fault during continuous run

To clear a flow fault and the flow fault icon, determine the cause of the fault, remedy the fault cause, and press [▲▼] to remove the icon from the LCD and restart the pump.

Note: *A low battery fault may occur instead of a flow fault when there is a low battery charge at the time of the fault, excessive back pressure, and/or when there is a very short distance between the restriction and the pump inlet (e.g., finger fault versus pinched tubing).* ***The flow fault icon will not appear and auto-restart will not be activated under these conditions.*** *A low battery fault icon will appear instead and the pump will go to Sleep.*

If pump goes to Sleep while in flow fault, the flow fault icon may remain displayed on the LCD when the pump is subsequently turned on. To remove the icon from the LCD, ensure the pump is in Hold, press ✷▲▼✷ to enter user setup functions, and press [▲▼] when "CLr" appears.

7. Cap the sample and send it with blanks and pertinent sampling information to a laboratory for analysis.

8. Verify the flow.
   a. Turn on the pump and reinstate the calibration train and sampling media.
   b. Take three readings and record the average value as the post-sample flow rate. **Do not adjust the pump flow rate during this step.**
   c. Compare the pre and post-sample flow rates. Note in sampling documentation if the values differ by more than ± 5%.



Set/Calibrate Flow Rate for Multiple Tubes

- *Requires Constant Pressure Controller (CPC) and Adjustable Low Flow Tube Holder (see Accessories). The low flow tube holder used with CPC allows up to four tube samples to be taken simultaneously, each at different flow rates if desired.*
- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Charge pump battery completely before calibration and sampling.*
- *Calibrate before each sampling operation using the tube holder and pump to be used for sampling.*
- *The flow rate through the pump is set first and then the flow rate through each sorbent tube is calibrated.*

Pump Flow Rate

1. Ensure that the battery is fully charged and that the pump has run for 5 minutes before calibrating.
2. Prepare the calibrator *(see calibrator instructions)*. Using flexible tubing, connect the calibrator outlet (suction port) to the pump inlet.
3. With the pump in a non-running state (no flashing blue LED), set the pump flow rate to ≥ 15% higher than the sum of the flow rate through all the tubes as follows:

Do not exceed 500 ml/min flow rate per tube for multiple-tube sampling.

a. Press ✹▲▼✹ to enter user setup functions.
b. Press ✹ until "ADJ" and "Flow" flash on display. Press ▲ to increase flow. Press ▼ to decrease flow (dashed lines will move up or down on the display to indicate graphically the direction of the adjustment) until calibrator indicates the method-specified flow rate. **Flow rate will not display on pump LCD. Observe the calibrator to determine flow rate.** Once the desired flow rate is indicated on the calibrator (within ± 5%), press [▲▼] to accept flow setting and to exit user setup functions. Take a minimum of three readings and record the average flow rate as per OSHA/NIOSH instructions.



- *Changing the flow rate in user setup functions will not clear accumulated run time.*
- *Changing the timed run and/or run delay settings in user setup functions will automatically clear accumulated run time.*

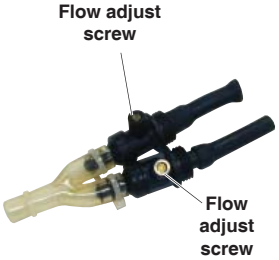
4. Remove tubing from the pump inlet and calibrator.

Flow Rate Through Sorbent Tubes

1. Attach the tubing on the CPC outlet (side of the CPC without a label) to the pump inlet. Attach the tube holder to the CPC inlet (marked "To Sample"). *See right.*
2. Break tips off the representative sorbent tubes and insert the tubes into the rubber sleeves on the holder (arrow on each tube pointing toward pump). Place unopened tubes in any unused ports to "seal" them.
3. Label all tubes and ports.
4. Using flexible tubing, connect the exposed end of the tube to the calibrator outlet (suction port).
5. Loosen and turn the brass flow adjust screw (*see right*) directly beneath the port holding the first active tube to be calibrated (**clockwise** to increase, **counterclockwise** to decrease) until the calibrator indicates the method-specified flow rate. **Do not adjust the flow rate on the pump.** ***Note:*** *For tri and quad models, first rotate each anti-tamper cover to expose the flow adjust screws, then adjust the appropriate one until the calibrator indicates the desired flow.*
6. Repeat Steps 4 and 5 for each active tube.
7. Once flow is calibrated for each active tube, it is recommended practice to re-check the flow rate through representative tubes before removing them. Any adjustment should be minimal.



Calibration train with Adjustable Low Flow Tube Holder



Turn screw on holder to adjust flow.

Set Up/Sample with Multiple Tubes

- *Requires Constant Pressure Controller (CPC) and Adjustable Low Flow Tube Holder (see Accessories). The low flow tube holder used with CPC allows up to four tube samples to be taken simultaneously, each at different flow rates if desired.*
- *Allow pump to equilibrate after moving it from one temperature extreme to another.*
- *Protect sample pump from weather when sampling outdoors.*
- *Use of any device or battery pack other than P85004 or P84002 to power the pump voids the UL Listing for intrinsic safety.*
- *Charge pump battery completely before calibration and sampling.*

1. Replace representative sorbent tubes used for calibration with new unexposed tubes for sample collection.

2. Place a tube cover over each tube and thread into place on holder until secure.

3. Place the adjustable holder with tubes where appropriate for sampling. For **personal sampling,** clip the sample collection media to the worker in the breathing zone and the pump to the worker's belt using the belt clip.

4. Start a continuous or timed sample run by pressing [▲▼]. Record start time and other pertinent information.
   - Sampling will start automatically if a run delay is set and initiated. Sampling will stop automatically if a timed run is set and initiated.
   - For automatic start and stop, set and initiate both a run delay **and** a timed run.

5. Sample for the time specified in the method used. Accumulated run time will display on the LCD.

6. To stop a sample run, press [▲▼]. This places the pump in Hold. Record stop time and other pertinent information.
   a. To resume sample run without clearing accumulated run time, press [▲▼].
   b. To clear accumulated run time, ensure pump is in Hold, press ✹▲▼✹ to enter user setup functions, and press [▲▼] when CLr displays.



Possible Displays During Sampling

Flow Fault ➤→I— If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters flow fault. During flow fault, the fault icon displays on the LCD and flashes during the length of the fault, the pump enters Hold mode, and the accumulated run time display is retained. The pump will restart in 15 seconds and try to continue sampling. If the flow remains restricted, the pump will return to flow fault. Auto-restart is attempted every 15 seconds up to 5 times. Flow fault time is not added to accumulated run time.



Flow fault during continuous run

To clear a flow fault and the flow fault icon, determine the cause of the fault, remedy the fault cause, and press [▲▼] to remove the icon from the LCD and restart the pump.

Note: *A low battery fault may occur instead of a flow fault when there is a low battery charge at the time of the fault, excessive back pressure, and/or when there is a very short distance between the restriction and the pump inlet (e.g., finger fault versus pinched tubing).* ***The flow fault icon will not appear and auto-restart will not be activated under these conditions.*** *A low battery fault icon will appear instead and the pump will go to Sleep.*

If pump goes to Sleep while in flow fault, the flow fault icon may remain displayed on the LCD when the pump is subsequently turned on. To remove the icon from the LCD, ensure pump is in Hold, press ✹▲▼✹ to enter user setup functions, and press [▲▼] when "CLr" appears.

7. Cap the sample tubes and send with blanks and pertinent sampling information to a laboratory for analysis.

8. Verify the flow.
   a. Turn on the pump and reinstate the calibration train and sampling media.
   b. Take three readings and record the average value as the post-sample flow rate. **Do not adjust the pump flow rate during this step.**
   c. Compare the pre and post-sample flow rates. Note in sampling documentation if the values differ by more than ± 5%.

Maintenance

Notes and Cautions

- For safe operation in hazardous locations, ensure the pump label contains the UL logo and the battery pack label contains Cat. No. P85004 or P85002. Use of any other battery pack or device to power the pump voids the UL Listing for intrinsic safety.
- Do not charge or operate pump from charger in hazardous locations.
- Use only the charger and battery packs designed for the AirChek XR5000 pump to ensure reliable performance. Failure to do so voids any warranty.
- 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.
- Tampering with the battery pack or using a repaired or rebuilt battery pack voids any warranty and UL Listing for intrinsic safety.
- Do not open, disassemble, short circuit, crush, incinerate, or expose the battery to fire or high temperatures.
- Use only the SKC-approved charger for this pump. Use of an unapproved charger may damage the battery and pump and voids any warranty.
- Failure to follow warnings and cautions voids any warranty.

Replace the Li-Ion Battery Pack

- *To retain display data, ensure pump is placed in Hold before disconnecting the battery pack. Display data will not be retained if battery is removed while pump is running.*
- *Completely charge a new battery pack before operating the pump.*
- *It may be necessary to charge the battery a few times before achieving maximum battery capacity.*
- *If the pump does not operate as expected after replacing the battery pack, see Reset Pump to Manufacturer Settings.*

1. Place pump in Hold (no flashing blue LED).
2. Release the battery pack by removing the two screws on the bottom of the battery pack housing.
2. Pull the battery pack housing away from the pump case.
3. Align the pump case with the new battery pack. The etched SKC logo should be on the same side as the LCD and keypad. Press the two parts together until snug. The pump will power up and the LCD will display the last mode used (typically Hold) and possibly accumulated run time from the last sample run.
4. Replace the two screws on the bottom of the battery pack housing and use a Phillips head screwdriver to tighten them in an alternating fashion.
5. Charge the new battery pack completely before use. *See Charge the Lithium-Ion Battery Pack.*

See www.skcinc.com/instructions/1918.pdf for more information on SKC pump lithium-ion (Li-Ion) battery packs.

Reset Pump to Manufacturer Settings

If the pump does not operate as expected, perform the following procedure:

1. Remove the battery pack. *See Replace the Li-Ion Battery Pack.*
2. On the pump keypad, press and hold ✹ and ▼ simultaneously while attaching the pump to the new battery pack. The LCD should display the software version number (525X).

Do not release hold on the two keys until the pump is firmly attached to the battery pack.

3. Release ✹ and ▼.
4. Press ✹ two times. The LCD should display 0. If it does not, repeat Steps 1 through 4 until 0 is displayed.
5. Install the two screws on the bottom of the battery pack housing and use a Phillips head screwdriver to tighten them in an alternating fashion.

Troubleshooting

Issue	Action/Resolution
Keypad will not respond	1. Observe the lower right corner of the pump display: if a flashing “L” is displayed, the keypad lock is activated. Press ▼ 5 times quickly to deactivate the keypad lock: the “L” should disappear. 2. If no “L” is displayed in the lower right corner of the pump display and the keypad does not respond, contact SKC for repair, www.skcinc.com/catalog/infopage.php?id=2400.

Accessories/Replacement Parts

Accessories	Cat. No.
chek-mate Calibrator, 0.75 to 5 L/min, includes 9-volt alkaline battery and NIST-traceable calibration certificate	**375-07550N**
Single Charging Kit, *for models with Li-Ion battery packs only,* 100-240 V AC, 50/60 Hz, includes charging unit, power supply, and interchangeable wall plugs	**223-241**
Take Charge 5 Five-station Li-Ion Battery Charger, *for Li-Ion model XR5000 pumps and Leland Legacy pumps,* includes charging unit and power cable, 100-240 V AC	**223-441**
Protective Pouches	
Red, for high visibility, for high-power model	**224-96A**
Black, noise reducing, for high-power model	**224-96C**
Black, for high-power model	**224-88**
Black, noise reducing, for standard model	**224-913**
Low Flow Kit (5 to 500 ml/min) *suitable for all XR5000 pump models,* for low flow single-tube sampling, includes All-in-One adjustable tube holder and Type A protective tube cover	**210-500**
Constant Pressure Controller (CPC), for low flow multiple-tube sampling in the 5 to 500 ml/min flow range. *Use with adjustable low flow holder listed below.*	**224-26-CPC**
Adjustable Low Flow Tube Holders (for 5 to 500 ml/min Sampling)	
Use with CPC listed above. Require separate tube covers listed below	
Dual	**224-26-02**
Tri	**224-26-03**
Quad	**224-26-04**
Sample Tube Protective Covers	
Use with adjustable flow tube holders listed above.	
Type A (tubes 6-mm OD x 70-mm L), *included in Low Flow Adapter Kit above*	**224-29A**
Type B (tubes 8-mm OD x 110-mm L)	**224-29B**
Type C (tubes 10-mm OD x 150-mm L)	**224-29C**
Type D (tubes 10-mm OD x 220-mm L)	**224-29D**

Replacement Parts	Cat. No.
Battery Packs	
4-cell Li-Ion* Battery Pack	**P85004**
2-cell Li-Ion* Battery Pack	**P85002**
Accessories	
Belt Clip	**P20139**
Filter/O-ring, pk/3	**P20140**
Inlet/Filter Housing	**P20142**
Inlet Filters, pk/50	**P40011**
Battery Jack Cover	**P20419**

** Li-Ion batteries may be subject to special shipping regulations.*

Cautions:

- **For safe operation in hazardous locations, ensure the pump label contains the c UL us LISTED logo and the battery pack label contains Cat. No. P85004 or P85002. Use of any other battery pack or device to power the pump voids the UL Listing for intrinsic safety.**
- **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.**
- **Any warranty and UL Listing for intrinsic safety are void if pumps are not repaired by SKC or authorized SKC repair centers.**
- **Failure to follow warnings and cautions voids any warranty.**

*** Li-Ion Battery Shipment**

Rechargeable lithium-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).

Consult with your carrier for more information on Lithium Battery Shipping Regulations UN 3480 and UN 3481 or visit SKC's website for more information.

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 http://www.skcinc.com/warranty.asp.

Appendix

Performance Profile

Flow Range	1000 to 5000 ml/min (5 to 500 ml/min requires optional low flow accessories. *See Accessories.*)
Compensation Range	5000 ml/min at 10 inches water back pressure 4000 ml/min at 20 inches water back pressure 2000 ml/min at 50 inches water back pressure
Typical Back Pressure of Sampling Media *(inches water)*	**Flow Rate (L/min)** / **Filter/Pore Size (µm)**: 1.0 / 1.5 / 2.0 / 2.5 / 3.0 / 3.5 / 4.0 / 5.0 **25-mm MCE/0.8**: 6 / 9 / 12 / 15 / 18 / 21 / 25 / 31 **25-mm MCE/0.45**: 14 / 22 / 28 / 35 / 40 / 44 / 50 / 63 **37-mm MCE/0.8**: 2 / 3 / 4 / 5 / 6 / 7 / 9 / 11 **37-mm PVC/5.0**: 1 / 1 / 2 / 2 / 2.5 / 3 / 3 / 4 **37-mm, polycarbonate/0.45**: 4 / 6 / 8 / 10 / 12 / 15 / 17 / 21 **25-mm MCE/0.45 microvacuum**: 21 / 31 / 40 / 48 / 59 / 69 / 79 / 100 **37-mm PTFE/1.0**: 1.5 / 2.5 / 4 / 5.5 / 7 / 8 / 9.5 / 12 *Compare the information in this table to pump compensation range to determine appropriate applications.*
Flow Compensation System	Patented* isothermal closed loop flow sensor
Accuracies	**Timing:** 1 min/mo at 25 C **Flow Rate:** ± 5% of set-point after calibration to desired flow
Battery Charge Level Indicator	Icon displays on LCD at full, mid, low charge, imminent low battery fault, and low battery fault.
Temperature Range	**Operating:** 32 to 104 F (0 to 40 C) **Charging:** 32 to 113 F (0 to 45 C) **Storage:** -4 to 95 F (-20 to 35 C)
Operating Humidity	0 to 95% non-condensing
Typical Run Time†	**XR5000 Model** / **2 L/min** / **5 L/min** ***High-power Li-Ion***: 40 hrs / 22 hrs ***Standard Li-Ion***: 20 hrs / 11 hrs † *Results of run time tests using 37-mm, 0.8-µm MCE filters with new pumps and batteries. Pump and battery performance may vary.* For extended run times, the pump may be operated while attached to the charger.
Timed Run, Run Delay, and Continuous Run Display Range	1 to 9999 minutes (6.8 days). If run time exceeds 6.8 days, timer display rolls over.
Flow Fault	If pump is unable to compensate for > 15 seconds due to excessive back pressure, the pump stops, displays flow fault icon, and holds run time display. Auto-restart is attempted every 15 seconds up to 5 times.
Low Battery Fault	15 seconds to sleep
Auto-off	5 minutes of inactivity
Battery Pack *(model dependent)*	**High-power Li-Ion (4 cell),** rechargeable, 7.4 V, 4.4-Ah capacity, 32.6 Wh (Cat. No. P85004 for UL Listed pump), or **Standard Li-Ion (2 cell),** rechargeable, 7.4 V, 2.2-Ah capacity, 16.3 Wh (Cat. No. P85002 for UL Listed pump)
Battery Recharge Time *(with SKC-approved chargers; varies with battery capacity and level of discharge)*	**Standard Li-Ion (2 cell):** approximately 4 hrs **High-power Li-Ion (4 cell):** approximately 8 hrs
Tubing	*Requires 1/4-inch ID tubing*
Size	**High-power Li-Ion:** 5.5 x 3 x 2.3 in (14 x 7.6 x 5.8 cm) **Standard Li-Ion model:** 4.3 x 3 x 2.3 in (10.9 x 7.6 x 5.8 cm)
Weight	**High-power Li-Ion:** 21 oz (0.6 kg) **Standard Li-Ion model:** 16 oz (0.45 kg)
Case	Anti-static plastic
RFI/EMI Shielding	CE marked for RFI/EMI protection
Approvals	• c UL us LISTED for use in hazardous locations. Models that are UL Listed for intrinsic safety contain the c UL us LISTED logo on the label. These models must be used with battery pack Cat. No. P85004 or P85002 to maintain the UL intrinsic safety listing. • RoHS compliant

* *U.S. Patent No. 5,892,160*