SKC

PocketPump®
210-1000 Series

Operating Instructions

Table of Contents

Indicates a caution or warning   *Indicates a reminder*

SKC Pocket Pump is an advanced low flow (20 to 225 ml/min) sample pump combining a lightweight and compact design with PC compatibility. When used with SKC sampling media such as sorbent sample tubes, the Pocket Pump is efficient and accurate for performing TWA, STEL, and Ceiling sampling for organic gases and vapors. A Pocket Pump model with twin ports for bag sampling is available as Cat. No. 210-1002A.

The result of extensive research and development, the Pocket Pump exemplifies SKC's commitment to quality and innovation in industrial hygiene sampling equipment.

Single port Pocket Pump for sorbent tube sampling (UL Listed)

Twin port Pocket Pump (Cat. No. 210-1002A) for sorbent tube sampling and bag sampling (not UL Listed)

Performance Profile

Flow Range in Constant Flow Mode:	20 to 225 ml/min
Accuracy Variance Between LCD Reading and Actual Flow Rate (after calibration):	20 to 225 ml/min ± 5%
Constant Flow Compensation Range (*inlet only*):	20 to 225 ml/min up to 20 inches water back pressure
Flow Control:	Holds constant flow to ± 5% of the set-point
Pressure Range in Constant Pressure (multiple-tube sampling) Mode (*inlet only*):	• 1 to 10 inches water (1.87 to 18.7 mm Hg) at maximum flow rate of 200 ml/min • 10 to 20 inches water (18.7 to 37.4 mm Hg) at maximum flow rate of 100 ml/min
Constant Pressure (multiple-tube sampling) Mode Accuracy:	Pressure reading ± 0.5 inch water (0.25 mm Hg)
Battery Charge Level Indicator:	Icon displays at full, mid, and low charge
Temperature Range:	**Operating:** 32 to 104 F (0 to 40 C) **Charging:** 40 to 100 F (5 to 38 C) **Storage:** -4 to 113 F (-20 to 45 C)
Operating Humidity:	0 to 95% non-condensing

> (!) *Protect sample pump from weather when in use outdoors.*

Tubing:	*Requires 1/4-in ID tubing*
Run Time: *(dependent on sample media used)*	• **With NiMH battery:** 12 hrs at 200 ml/min up to 10 inches water back pressure 12 hrs at 100 ml/min up to 20 inches water back pressure *(Run time is 8 hrs at either setting if using a NiCad battery.)* • **Connected to charger:** Extended run time

- *RFI/EMI shielded*
- *CE marked*
- c (UL) us *Listed for intrinsic safety (single port models only)*
- *Model 210-1002TX is ATEX approved*

Timer:	1 to 9999 min display ± 1% accuracy
Flow Fault:	If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters FLOW FAULT mode. The pump goes into HOLD, the fault icon appears on the display, and the accumulated run time display is frozen and retained. After 5 minutes in flow fault, auto-restart is attempted every 5 minutes until flow is corrected or the user removes the pump from flow fault mode by pressing [▲▼].
Battery Pack:	**Rechargeable nickel-metal hydride (NiMH) battery pack,** 2.4 V x 1.0 Ah
Charge Time: *(varies with battery capacity and level of discharge)*	**Attached to pump:** ≤ 6 hrs **Detached from pump:** 16 hrs (*recommended charging method for initial charge of a new battery pack*)
Size:	4.5 x 2.2 x 1.4 in (11.4 x 5.6 x 3.6 cm) - *see photo below*
Weight:	5 oz (142 gm)

⊙ *The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.*

Note: *Newer pump models contain an NiMH battery. An NiMH battery can be used with older Pocket Pump models. Order NiMH Battery Pack Cat. No. P20129-2.*

Note: *Pocket Pump was designed to minimize inherent noise. If the noise level is distracting when worn in a shirt pocket, clip the pump on a waist belt.*

2.2 inches

4.5 inches

1.4 inches

Battery Installation/Charging

Installing/Replacing the Battery Pack

To enhance battery life, SKC ships battery packs separate from the pump.

Completely charge a new battery pack **detached** from the pump before installing.

1. Completely charge the new battery pack detached from the pump *(see page 6)*. This initial slow (16-hour) charge will provide optimum battery performance. Following charging, install the new battery pack.

2. Press down on the sliding keypad cover near the SKC logo. Push the keypad cover down and away from the display until it is free from the pump case.
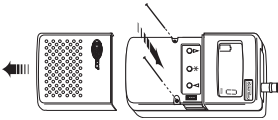
3. Lay the pump on a flat surface with the LCD facing upward. Remove the two screws on the front panel of the pump.
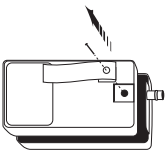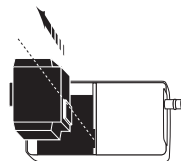
4. Turn the pump over so that the LCD faces down. Remove the belt clip by unscrewing the single locking screw, and remove the battery compartment cover.

The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.

5. If replacing the battery, unplug the old battery pack by carefully lifting it upward, and remove it from the pump.

6. Align the jack on the new/replacement battery pack with the pins on the pump. Press into place. Replace the battery compartment cover and belt clip removed in Step 4.
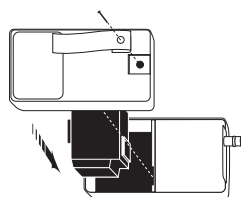
7. Turn the pump over so that the LCD faces upward. Replace the two screws on the front panel of the pump (do not overtighten the screws). Replace the keypad cover by aligning it with the ridges on each side of the keypad, pressing it down, and pushing it upward.
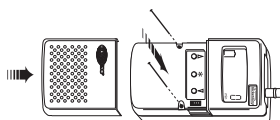
For subsequent charging, charge battery pack attached to the pump (*see page 6*).
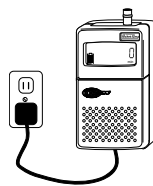
Do not charge or operate the pump with the charger in hazardous locations.

Use only the SKC-approved battery pack designated for the Pocket Pump to ensure reliable performance and to maintain the SKC warranty and UL Listing for intrinsic safety.

Use only the SKC-approved chargers to charge this pump.

Battery Installation/Charging

Battery Pack Charging System

The SKC Pocket Pump features the innovative "Smart Charging Battery System." The advanced technology of the battery pack's circuitry provides multiple features:

- It allows the battery pack to regulate the charge it receives by reducing its fast charge rate to a trickle charge rate when the battery is at maximum capacity thus preventing damage to the battery.
- It is also designed to prevent harm to the battery by charging only if the battery is within its acceptable charging temperature range of 40 to 100 F (5 to 38 C). Outside of this range, the battery will only accept the low output trickle charge.

Charging the Battery Pack

Note: *The initial charge of a new battery should be performed with the battery **detached** from the pump. For installation after charging, see pages 4 and 5.*

⊘ *Ensure proper orientation of the charging cable <u>before</u> plugging it into the charging jack. Improper orientation/contact will short-circuit the battery.*

⊘ *Short-circuiting the battery pack will render it immediately inoperative.*

Battery detached: Plug the charger into a standard wall outlet and the charging plug into the port on the battery pack. This type of charge is a slow trickle charge that is recommended for the initial charge of a new battery pack. This charge will take approximately 16 hours to complete.

Battery attached: For a complete charge, ensure the pump is **not** running. Plug the charger into a standard wall outlet and the charging plug into the battery port on the bottom of the pump. The fast charging function of the battery pack will completely recharge the battery in approximately six hours or less.

- *During "fast-charging," the battery icon displays a solid outline with three flashing bars.*
- *During "trickle-charge" and upon receiving a full charge, the battery icon is a solid outline with three solid bars.*

☞ *After charging the battery pack, it is good practice to run the pump for approximately five minutes before calibrating. This ensures the battery is in more steady-state conditions and improves the agreement in pre and post-sampling calibrations.*

See page 8 for Determining Battery Charge Levels.

⊘ *Unplug the charging plug from the Pocket Pump battery port when finished charging the battery pack. If the charger is unplugged from a wall outlet and the charging plug is left in place, the battery charge will deplete.*

⊘ *Do not charge or operate the pump with the charger in hazardous locations.*

⊘ *Ensure the computer interface port is covered before, during, and after charging.*

⊘ *Failure to follow warnings and cautions voids any warranty.*

Note: *The battery pack may be kept on the SKC-approved charger for an indefinite time.*

6

Charging Fault

When the top bar is flashing and the bottom two bars are solid, a charging fault has occurred. A charging fault may be caused by:
- *Ambient temperatures that are out of charging temperature range*
- *A defective battery pack*
- *A disrupted charge cycle*

To remove a charging fault, unplug the charger, allow the pump to equilibrate to ambient temperature, and try to charge the battery again. If the icon display persists, contact SKC Technical Support at skctech@skcinc.com.

FAIL Display

Symptom: Press [▲▼] from HOLD mode to RUN the pump. The pump will not run and immediately goes back to HOLD mode.

Display: Press ✳ to scroll through the display until FAIL appears.

Explanation: FAIL is a type of fault caused by battery capacity that is insufficient to start the pump motor. This indicates a battery pack that has either developed a fault or is at the end of its life. ***The fault cannot be fixed by recharging the failing battery pack.***

Solution: Remove the battery pack and replace with a new, fully charged battery pack. Run the pump and scroll through the display. If the pump runs and FAIL is not displayed, the fault is fixed. If FAIL still displays, there is a fault in the pump electronics. Send the pump to SKC for repair.

Use only SKC-approved batteries to ensure reliable performance and intrinsic safety.

Using a non-approved charger voids any warranty and could damage the pump or battery.

Battery Installation/Charging

Determining Battery Charge Level

- The pump will operate for up to 12 hours with a NiMH battery (eight hours with NiCad) at a flow rate of 200 ml/min and back pressure of 10 inches of water. Pump operation time will increase as flow rate and back pressure rates are decreased.

- The LCD shows the current battery charge level. The icons appear as follows:

Three bars indicate a full charge (normally appear after charging), approximately 70 to 100%.

Two bars indicate that the battery is charged enough to operate the pump, approximately 15 to 70%.

One bar indicates battery charge is low (charge battery), approximately less than 15%.

When the battery has lost all of its charge, all bars are clear and the outline is flashing. The pump goes into HOLD mode and then to SLEEP mode in approximately one minute.

Extended Runs Using the Charger

Extended operation is possible in **nonhazardous locations** using the pump with its battery charger plugged into a wall outlet.

Note: *The battery will discharge during an extended run. However, when the charge drops by 50%, the fast charge feature is initiated until the battery receives a full charge. This cycle repeats every several hours during operation.*

Do not charge or operate the pump with the charger in hazardous locations.

Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Interpreting Pump Operating Terms

In this manual, "run time data" refers to all the terms listed below:

FLOW: Flow rate in milliliters per minute (ml/min)

VOLUME: Total volume of air in milliliters (ml) or liters (L) since reset

PRESSURE: Pump back pressure measured in inches (ins) of water or millimeters (mm) of Hg

TEMP: Temperature of incoming air in C or F

RUN TIME: Time pump has run in minutes (min) since reset

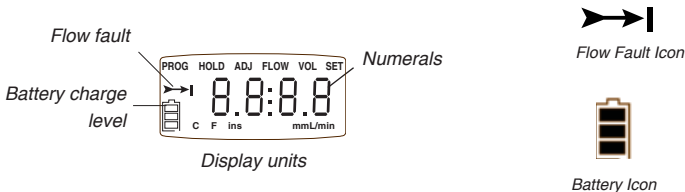FAIL: A type of fault indicating insufficient battery capacity (*see page 7*)

Interpreting the LCD

Operating Indicators

PROG: Active when a program is loaded into the Pocket Pump memory by DataTrac® Software

HOLD: Active when the Pocket Pump is in HOLD mode

ADJ: Active when the Pocket Pump is being flow calibrated

FLOW: Active when the LCD shows the flow rate

VOL: Active when the LCD shows the volume of air pumped

SET: Flashes when setting the flow rate

Icons

Flow Fault: Flashes during flow fault (*see graphic below and page 11*)

Battery: Shows battery charge status (*see graphic below and page 8*)

Operating indicators

Flow fault

Battery charge level

PROG HOLD ADJ FLOW VOL SET

C F ins mmL/min

Numerals

Display units

Flow Fault Icon

Battery Icon

Setup

Operating the Keypad

The Pocket Pump operates by pressing various sequences of the three keypad buttons located beneath the sliding cover. Operate the Pocket Pump with the following key sequences:

Pocket Pump Keypad

Star Button ✳
- Scrolls through run time data and setup options displayed on the LCD

Up and Down Arrow Buttons ▲ ▼
- Toggle between display units and increase or decrease sampling parameters in setup

Underlined Sequence ✳▲▼✳ (Security Code)
- Press buttons in sequence within 10 seconds of the previous command.
- Pocket Pump operating parameters cannot be changed without pressing the security code sequence.
- The security code may be required at various points during programming.

Bracketed [▲▼]
- Press buttons simultaneously.

Button sequences are shown in the order in which the buttons should be pressed.

Pressing both the up and down arrow buttons simultaneously places a running pump in HOLD or a holding pump in RUN.

Determining Pump Operating States

RUN

- The pump is sampling and run time data is updated continuously in memory.

HOLD

- The pump is not sampling and run time data is stored. Hold displays on the LCD.
- Temperature and back pressure readings are still active and shown on the LCD.

FLOW FAULT (➤➤|)

- If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters FLOW FAULT mode and the flow fault icon displays on the LCD.
- The pump goes into HOLD mode and the accumulated run time display is frozen and retained.
- The pump attempts to restart sampling after five minutes in flow fault and continues to attempt a restart every five minutes thereafter until the flow is corrected or the user removes the pump from flow fault mode by pressing [▲▼].

SLEEP

- The LCD shuts down and the electronic circuitry enters a low power state. The pump automatically enters SLEEP mode after five minutes in HOLD unless the battery charger is plugged in or a keypad button is pressed.

FAIL

- A fault state in which the battery capacity is insufficient to run the pump motor (*see FAIL Display on page 7*)
- FAIL displays on the LCD as part of the data display. Press ✳ to scroll to the FAIL display.

To change the pump from HOLD to RUN, press [▲▼].

To change the pump from RUN to HOLD, press [▲▼].

To change the pump from SLEEP to HOLD, press any button.

➤➤|

Flow Fault Indicator

The time the pump is in Flow Fault mode is not added to run time or cumulative volume.

11

Setup

Setting Up the Pump

To activate the pump:
- Press any keypad button. The LCD will show the pump serial number for two seconds followed by a firmware revision number.

To obtain run time data:
- Press the ✳ button repeatedly to scroll through run time data.

To reset the data display to zero:
- With the pump running, press:

[▲▼] to place in HOLD, ✳▲▼✳ to enter Setup, and ✳✳.

The LCD will show briefly the pump serial number, firmware version number, and run time at zero minutes. This will reset all run time data except the flow setting. *See instructions on page 15 to change the flow setting.* If you do not want to reset the run time data after entering the security code, stop and wait 10 seconds to break the sequence. The LCD will stop flashing at this point.

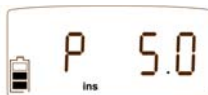### To determine pump operating mode (constant flow or constant pressure):
- Observe the LCD. Use the ✳ button to scroll through the displays if necessary.

Constant flow mode	Constant pressure mode (Multiple tube)
1 to 3 digit number is displayed with "mL/min" and "FLOW"	1 to 3 digit number is displayed with "P" and "ins" or "mm"

Pump run time is a converse relationship: Low flow + low Bp = longer run time
High flow + high Bp = shorter run time

To change pump operating mode (constant flow or constant pressure):
- With the pump running, press:

  [▲▼] to place in HOLD, ✳▲▼✳ to enter Setup, and ✳▼▲✳

  The display will now show the new operating mode.

For information on operating the pump in constant pressure mode, see Advanced Operation on page 21.

To determine the pump display:
- **Standard display** includes flow, volume, and run time. Press ✳ to scroll through run time data.

- **Enhanced Display** includes flow, volume, back pressure, temperature, and run time. Press ✳ to scroll through run time data.

To select the pump display:
- **Standard to Enhanced Display:**
  With the pump running, press:

  [▲▼] to place in HOLD, ✳▲▼✳ to enter Setup, and ✳▲▲✳

  The enhanced data display will include **flow**, **volume**, **back pressure**, **temperature**, and **run time**.

- **Enhanced to Standard Display:**
  With pump running, press:

  [▲▼] to place in HOLD, ✳▲▼✳ to enter Setup, and ✳▼▼✳

  The standard data display will include **flow**, **volume**, and **run time**.

To select the temperature scale display:
- In enhanced display, the temperature of incoming air can be shown in either Celsius (C) or Fahrenheit (F). Use the ✳ button to scroll to the temperature scale display units.

Setup

To change the temperature scale display:

• In enhanced display and with the pump running, press:

[▲▼] to place in HOLD, ✱▲▼✱ to enter Setup, and [✱▼]

Press ✱ to scroll to the temperature display. The display will show the newly selected temperature scale.

To select the pressure units display:

• In enhanced display, back pressure can be shown in either inches (ins) of water or millimeters (mm) of mercury. Use the ✱ button to scroll to the back pressure display units.

To change the back pressure units display:

• In enhanced display and with the pump running, press:

[▲▼] to place in HOLD, ✱▲▼✱ to enter Setup, and [▲✱]

Press ✱ to scroll to the pressure display. The display will show the newly selected pressure unit.

*Underlined keypad button sequences indicate that the buttons must be pressed in sequence **within 10 seconds of the previous command.***

*Bracketed keypad button sequences indicate that buttons must be pressed **simultaneously.***

Calibrating and Sampling in Constant Flow Mode — Single Sorbent Tube

Calibration

(!) *Allow the pump to equilibrate after moving it from one temperature extreme to another.*

1. Ensure the pump has run for five minutes before proceeding with calibration.

2. Set the pump for Constant Flow mode (*see pages 12 and 13*).

3. Using a length of tubing, connect the pump inlet to a representative sorbent tube using an SKC sample tube holder.

4. Connect the exposed end of the tube to a calibrator using another length of tubing.

5. Press [▲▼] to RUN the pump.

6. Press ✴▲▼✴ (security code) within 10 seconds. The word **SET** will flash on the LCD.

7. The LCD will display the flow rate set from the last sample taken. If you do not wish to change the flow rate, go to Step 9.

8. Press ▲ or ▼ to change the flow rate to the desired setting as shown on the LCD.

(!) *Do not charge or operate the pump with the charger in hazardous locations.*

Operation

9.   Press ✷. **ADJ** will appear on the LCD. The pump flow rate can now be calibrated using a calibrator. *See reminder below.*

10. When the flow rate reading appears on the calibrator, press the ▲ or ▼ buttons on the pump keypad to adjust the flow up or down until the **calibrator** displays the desired flow rate.

11. Press ✷ to lock in the calibrated flow. The pump will then enter its normal RUN state.

12. Press [▲▼] to place the pump in HOLD. Press ✷▲▼✷ (security code) and ✷✷ to reset the data display to zero (minutes that have elapsed during pump setup and/or programming) before sampling.

13. Disconnect the calibrator and replace the representative sample tube with the tube to be used for sampling.

Sampling

1.   Clip the sampling medium to a worker's collar in the breathing zone and place the pump in the worker's shirt pocket or clip to the worker's belt.

2.   Press [▲▼] to RUN the pump and begin sampling.

3.   Press [▲▼] to HOLD the pump and stop sampling. Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the ✷ button to scroll through run time data on the LCD.

4.   Remove and cap the tube. Replace the representative tube in the holder and reconnect the calibrator. Verify that the flow rate has remained within 5% of the pre-sample calibrated flow.

When calibrating, the flow rate displayed on the calibrator will change as a result of this adjustment, not the flow rate displayed on the pump.

Protect the sample pump from weather when in use outdoors.

Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Calibrating and Sampling in Constant Flow Mode — Multiple Tubes

### For use with constant pressure controller and multi-port adjustable low flow tube holders

The Constant Pressure Controller (CPC) (Cat. No. 224-26CPC-10) is a pump accessory that provides a simple alternative for multiple sorbent tube sampling while in Constant Flow mode. In conjunction with an Adjustable Low Flow Tube Holder (Cat. No. 224-26-02, 224-26-03, or 224-26-04), the CPC is used as a pressure regulator to maintain a constant 10 inches water back pressure. *For multiple-tube applications without a CPC, see Advanced Operation on page 21.*

Calibration

⚠ *Allow the pump to equilibrate after moving it from one temperature extreme to another.*

1. Ensure the pump has run for five minutes before proceeding with calibration.

2. Set the pump for Constant Flow mode (*see pages 12 and 13*) and set it to the selected flow rate (*see pages 15 and 16, Steps 5 through 12*). Pump flow rate must be set at ≥ 15% higher than the sum of the flow rates through all tubes.

3. Connect the pump inlet to the CPC outlet (the side of the CPC without a label) using the short length of Tygon® tubing supplied on CPC.

4. Connect the inlet side of the CPC (marked "to sample") to the Adjustable Low Flow Holder.
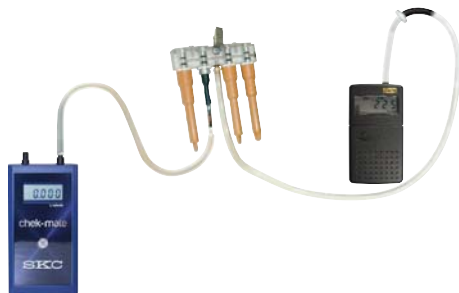
Note: *When multi-tube sampling with a CPC, the flow rate of the pump must be set at ≥ 15% higher than the sum of the flow rates through all tubes.*

Note: *When sampling with the CPC accessory, the volume displayed on the pump is no longer representative of the volume of flow through the tubes due to the air bypass function of the CPC.*

Operation

5. Label all tubes and ports (e.g., tube #1, port A).

6. Insert opened representative tubes into the ports. Place unopened tubes in any unused ports to "seal" them. This is essential to obtain correct results.

7. Loosen the flow adjust screw on the low flow tube holder port containing the tube to be calibrated. Connect the exposed end of the tube to a calibrator using another length of tubing.

8. Press [▲▼] to RUN the pump.

9. Turn the flow adjust screw (needle valve) on the adjustable tube holder port until the **calibrator** displays the desired flow rate through the tube. The flow rate displayed on the calibrator changes as a result of this adjustment.

10. To calibrate flow through the remaining tubes, repeat Steps 7 through 9 for each port.

11. Press [▲▼] to place the pump in HOLD mode. Press ☀▲▼☀ (security code) and ☀☀ to reset the data display to zero before sampling.

12. Disconnect the calibrator and replace the representative tubes with the tubes to be used for sampling. The pump is ready to sample.

Sampling

1. Clip the sampling medium to a worker's collar in the breathing zone and place the pump in the worker's shirt pocket or clip to the worker's belt.

2. Press [▲▼] to RUN the pump and begin sampling.

3. Press [▲▼] to HOLD the pump and stop sampling.

Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the ☀ button to scroll through run time data on the LCD.

4. Remove and cap tubes. Reconnect calibration train and verify the flow rate.

---

*All empty ports must contain **unopened** tubes during calibration and sampling.*

Protect the sample pump from weather when in use outdoors.

Do not charge or operate the pump with the charger in hazardous locations.

Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Calibrating and Sampling with Bags
Requires Twin Port Pocket Pump Cat. No. 210-1002A

Outlet (exhaust) — Inlet

Twin port Pocket Pump sampling train with bag

Calibration

⚠️ *Allow the pump to equilibrate after moving it from one temperature extreme to another.*

1. Ensure the pump is set in Constant Flow mode (*see pages 12 and 13*).

2. Use tubing to connect a calibrator to the pump inlet.

3. Press [▲▼] to RUN the pump.

4. Press ✳▲▼✳ (security code) within 10 seconds. The word **SET** will flash on the LCD.

5. The LCD will display the flow rate set from the last sample taken. If you do not wish to change the flow rate, go to Step 7.

6. Press ▲ or ▼ to change the flow rate to the desired setting as shown on the LCD.

7. Press ✳. **ADJ** will appear on the LCD. The pump flow rate can now be calibrated using a calibrator. *See reminder below.*

8. When the flow rate reading appears on the calibrator, press the ▲ or ▼ buttons on the pump keypad to adjust the flow up or down until the **calibrator** displays the desired flow rate.

☞ *When calibrating, the flow rate displayed on the calibrator will change as a result of this adjustment, not the flow rate displayed on the pump.*

Operation

9. Press ✳ to lock in the calibrated flow. The pump will then enter its normal RUN state.

10. Press [▲▼] to place the pump in HOLD. Press ✳▲▼✳ (security code) and ✳✳ to reset the data display to zero (minutes that have elapsed during pump setup and/or programming) before sampling.

11. Disconnect the calibrator and tubing.

Sampling

1. Ensure the data display has been reset to zero (*see page 12*).

2. Using a length of PTFE tubing, connect the pump outlet (exhaust) to the hose connection on the fitting of a prepared sample bag. Ensure shut-off valve is open on the bag fitting. *See sample bag operating instructions for details.*

3. Press [▲▼] to RUN the pump. Sample for the appropriate length of time.

Do not over-inflate the sample bag. Avoid filling the bag more than 80% of its maximum volume.

Incorrect Inflation
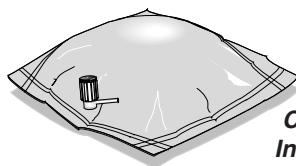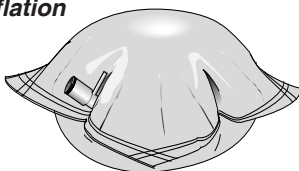
Correct Inflation

4. When sampling is complete, press [▲▼] to place the pump in HOLD and stop sampling. Close the shut-off valve on the sample bag fitting. *See sample bag operating instructions for details.*

Calibrating and Sampling in Constant Pressure Mode — Multiple Tubes
For use with multi-port adjustable low flow tube holders only.

Calibration

⚠️ *Allow the pump to equilibrate after moving it from one temperature extreme to another.*

1. Ensure the pump has run for five minutes before proceeding with calibration.

2. Set the pump to enhanced display and Constant Flow mode (*see pages 12 and 13*). Remain in these modes until ready to calibrate.

3. Connect the pump to an Adjustable Low Flow Tube Holder (*see Accessories, page 27*). Use a screwdriver to turn all the flow adjust screws counterclockwise until they are flush with the tube holder surface.

4. Label all tubes and ports (e.g., tube #1, port A).

5. Insert the first opened representative tube (#1) into the first port ("A"), etc. Place unopened tubes in any unused ports to "seal" them. This is essential to obtain correct results.

6. Set the desired flow rate to a calibrator (*see pages 15 and 16, Steps 5 through 11*) as specified by the method for tube #1 in port A. Record the flow rate. *See cautions below.*

7. While the pump is in RUN, press the ✳ button to scroll to Constant Pressure reading (ins or mm). Record the back pressure for that tube. Press [▲▼] to place the pump in HOLD.

8. Repeat Steps 5 through 7 for each port to obtain the back pressure for each representative tube.

⚠️ *All empty ports must contain **unopened** tubes during calibration and sampling.*

⚠️ *When performing multiple-tube sampling in Constant Pressure mode, the flow rate must be set as low as possible. The sum of the flow rates cannot exceed 100 ml/min for back pressures from 10 to 20 inches of water; the sum of the flow rates cannot exceed 200 ml/min for calculated back pressures less than 10 inches of water.*

9. Obtain the calculated back pressure by adding one inch to the highest back pressure number and rounding up to the next number. The additional inch allows for typical back pressure fluctuations.

Example using two tubes:

Tube	Port	Flow (ml/min)	Back Pressure (in H_2O)
1	A	20	6.2
2	B	50	7.9

Calculated back pressure is 9 (7.9 + 1 = 8.9 rounded to 9).

---

10. Reinsert opened representative tube #1 back into port A. Place unopened tubes in remaining port(s) to "seal" them.

11. Reset the pump to the desired flow rate for port A as done in Step 6.

12. While the pump is still in RUN, press ✳ to scroll to Constant Pressure reading (ins or mm). Use a screwdriver to turn the flow adjust screw clockwise for port A on the Adjustable Low Flow Tube Holder until the display matches the calculated back pressure. Press [▲▼] to place the pump in HOLD.

13. Repeat Steps 10 through 12 for remaining port(s).

14. Place the pump in Multiple Tube (Constant Pressure) mode. From RUN, press [▲▼] to place the pump in HOLD, ✳▲▼✳ (security code), and ✳▼▲✳.

Pressing [▲▼] will place a running pump in HOLD and a holding pump in RUN.

Do not charge or operate the pump with the charger in hazardous locations.

15. Set pump pressure to the calculated back pressure. From HOLD, press [▲▼] to RUN the pump, then enter ✴▲▼✴ (security code) within 10 seconds. The LCD will display the previously set back pressure, with flashing **SET** and **P** indicators. The flow fault icon may also be flashing at this point.

16. Press ▲ or ▼ to increase or decrease the previously set back pressure setting until it matches the calculated back pressure determined in Step 9. Press ✴ to lock in the pressure setting. The pump will return to its normal RUN state.

17. Reset the data display to zero (minutes that have elapsed during pump setup and/ or programming) before sampling by pressing [▲▼] to place pump in HOLD, ✴▲▼✴ to enter Setup, and ✴✴.

18. Remove the representative tubes used for calibration and insert newly opened tubes in their assigned ports. The pump is now ready to sample.

Sampling

1. Press [▲▼] to RUN the pump and begin sampling.

2. Press [▲▼] to HOLD the pump and stop sampling.

Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the ✴ button to scroll through run time data on the LCD.

3. Remove and cap the tubes. Reconnect the calibration train to verify flow rate.

(!) *Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.*

(!) *Protect the sample pump from weather when in use outdoors.*

(!) *All empty ports must contain **unopened** tubes during calibration and sampling.*

Pump Care

The Pocket Pump has been carefully designed, manufactured, and tested to provide excellent performance. Proper care and maintenance include:

- Avoiding strong impacts

- Keeping the pump dry

- Not cleaning the pump with harsh cleaning solvents or detergents

- Storing the pump in a cool, dry, dust-free location

- If the sampling method used requires collection of the sample via the exhaust port on the pump (sample passes through the pump such as bag sampling with the twin port Pocket Pump), ensure that the sample air is dry and does not contain corrosive constituents. Failure to do so could lead to contamination of the pump, degradation of performance, or failure of the pump. **Failure to follow this caution voids any warranty.**

- Following instructions in the Battery Installation/Charging section to maximize battery life

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

(!) *The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.*

(!) *Failure to follow warnings and cautions voids any warranty.*

DataTrac for Pocket Pump Software

With the optional DataTrac for Pocket Pump Software accessory, the Pocket Pump is programmable using a PC. DataTrac simplifies chain-of-custody reporting by allowing users the option of programming a complete running sequence, delayed start, and timed stop, all at different flow rates. Time and sample volume are continuously updated in memory. There is no need to perform lengthy calculations; DataTrac does it for you. The advanced information retrieval system is specifically designed to store data and provide chain-of-custody information. Fault features allow storage of historical data in memory that can be retrieved up to 24 hours after shutdown.

Features
- Program a sampling operation from a PC
- Calibrate pump flow to a calibrator
- Display the operating mode including Constant Flow or Constant Pressure, temperature, run time, and battery status of the connected pump
- Create a Pocket Pump program on a PC and upload to the pump for operation in the field
- Program up to 14 sampling sequences, each with different flow rates
- Download pump run time data and history to a PC
- Document sampling history using the sample set up feature
- Print a history file containing pump run time data
- Print a worker exposure profile containing run time data and the pump's history

DataTrac for Pocket Pump System Requirements
- Hard drive with a minimum of 20 MB free disc space
- CD-ROM drive
- Available USB port for use with SKC USB DataTrac adapter cable
- Mouse
- Microsoft Windows® XP or higher, including Windows 7 (64 bit)

Accessories

With DataTrac Software you can...

Create a sample sheet for worker & sample information

Download the pump sampling history

Create a sample schedule selecting the date, time, and flow rates that you wish to sample

Simply click to change the pump settings

DataTrac for Pocket Pump Software
Includes software and instructions on CD and DataTrac adapter cable
(*see page 25 for requirements*)
Cat. No. 877-90

Accessories/Replacement Parts

Description	Cat. No.
Chargers	
5-station, Multi-charger, 115 V	223-427
5-station, Multi-charger, 100-240 V	223-107A
Single, 115 V	223-228
Single, 100-240 V	223-229A
DataTrac for Pocket Pump Software includes software CD and	
DataTrac adapter cable *(see pages 25 and 26 for details)*	877-90
Replacement Parts	
Battery Pack (NiMH)	P20129-2
Belt Clip	P51821
Case	P20120
Filters (10)	P40010
Keypad	P79360
Pressure Sensor	P20134
Spring Clips	P51102
Screw/Tubing Kit	P21001
Protective Front Cover	P20131
Constant Pressure Controller (CPC) for Pocket Pump	224-26CPC-10
Sample Tube Holders for Constant Flow Applications (includes tube cover)	
Type A (tubes 6-mm OD x 70-mm length)	222-3-1
Type B (tubes 8-mm OD x 110-mm length)	222-3L-1
Type C (tubes 10-mm OD x 150-mm length)	222-3XL-1
Type D (tubes 10-mm OD x 220-mm length)	222-3XD-1
Adjustable Low Flow Tube Holders for Constant Pressure Applications	
(requires separate tube cover)	
Dual	224-26-02
Tri	224-26-03
Quad	224-26-04
Sample Tube Protective Covers	
(for adjustable flow tube holders)	
Type A (tubes 6-mm OD x 70-mm length)	224-29A
Type B (tubes 8-mm OD x 110-mm length)	224-29B
Type C (tubes 10-mm OD x 150-mm length)	224-29C
Type D (tubes 10-mm OD x 220-mm length)	224-29D

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

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

Index