



Rocket Pump[®]
210-1000 Series

Operating Instructions

**SKC Inc.
863 Valley View Road
Eighty Four, PA 15330 USA**

Form #37717 - Rev 0605

Table of Contents

Description	1
Performance Profile	2
Introduction	4
Interpreting Pump Operating Terms	4
Interpreting LCD	4
Operation	5
Operating the Keypad	5
Determining Pump Operating States	6
How to Set up Pump	7
Calibrating/Setting for Constant Flow Applications	10
Setting for Multiple Tube Sampling Using Constant Flow Mode	12
Setting for Multiple Tube Sampling Using Constant Pressure Mode	14
Pump Care and Maintenance	17
Battery Care and Maintenance	18
Replacing Battery Pack	18
Battery Pack Charging System	20
Charging Battery Pack	21
Discharging Battery Pack	22
Continuous Operation Using Charger	22
Battery Notes	23
Technical Note	24
Service Policy	25
Accessories	26
DataTrac Software	26
Optional Accessories	28
Warranty	29
UL Certificate	30
Index	31



Indicates a caution or warning.



Indicates a reminder.

These Pocket Pump Operating Instructions are also available in Spanish and French Canadian. Visit www.skinc.com.

Notice: This operating instruction may not address all safety concerns (if any) associated with this product and its use. The user is responsible for determining and following the appropriate safety and health practices and regulatory limitations (if any) before using the product. The information contained in this document should not be construed as legal advice, opinion, or as a final authority on legal or regulatory procedures.

Description

Your new SKC Pocket Pump is an advanced low flow sample pump combining light-weight and compact design with computer-compatible circuitry. 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.

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



Flow Rate: 20 to 225 ml/min



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 \pm 5%
Constant flow compensation:	\pm 5% of flow reading up to 20 inches water
Pressure range in constant pressure (multiple tube sampling) mode:	1 to 10 inches water (1.87 to 18.7 mm Hg) at maximum flow rate of 200 mL/min for 8 hrs (12 hrs if using NiMH battery). 10 to 20 inches water (18.7 to 37.4 mm Hg) at maximum flow rate of 100 mL/min for 8 hrs (12 hrs if using NiMH battery).
Constant pressure (multiple tube sampling) mode accuracy:	Pressure reading \pm 0.5 inches water (0.25 mm Hg)
Battery charge level indicator:	Icon displays at full, mid, and low charge
Temperature range:	
Operating:	20 to 110 F (-7 to 43 C)
Charging:	40 to 100 F (5 to 38 C)



Protect sample pump from weather when in use outdoors.

Run time:	Total varies with flow rate and sampling media in line. At 200 mL/min, 10 inches water back pressure, nominal run time is approx. 8 hrs. At 200 mL/min and 20 inches water back pressure, nominal run time is approx. 6 hrs. Connected to a charger, run time is indefinite. If using a Nickel Metal Hydride battery, run times are increased to up to 12 hrs in most sampling situations.
------------------	---

-
- **RFI/EMI shielded**
 - **CE approved**
 - **UL and cUL listed.**  
 - **ATEX-approved model 210-1002**

Note: If using a Nickel Metal Hydride (NiMH) battery pack, run times are extended to up to 12 hours in most sampling situations.

See UL Certificate on page 30.

Performance Profile

Timer:	1 to 9999 min display $\pm 1\%$ accuracy
Flow fault:	Pump stops and holds historical data when flow is restricted. Auto-restart attempted every 5 min.
Battery pack:	Built-in battery pack Rechargeable NiCad 2.4 V x 0.6 Ah or Nickel Metal Hydride (NiMH) 2.4 V x 1.0 Ah. <i>See Battery Notes and Technical Note on pages 23 and 24.</i>
Size:	4.5 x 2.2 x 1.4 inches (11.4 x 5.6 x 3.6 cm)
Weight:	5 ounces (142 gm)



The use of a repaired or rebuilt battery pack voids the SKC warranty and the UL Intrinsic Safety Listing

Note: Newer pump models contain an NiMH battery. An NiMH battery can be used with older Pocket Pump models. Simply order Replacement Part No. P20129-2 NiMH Battery Pack.

Note: SKC designs its pumps to minimize inherent noise. If the noise level is disturbing when the Pocket Pump is worn in a shirt pocket, SKC recommends clipping the pump on a waist belt.



Introduction

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) Hg.
TEMP: Temperature of incoming air in C or F.
RUN TIME: Time in minutes (min) since reset.
FAIL: A type of fault indicating insufficient battery capacity (*see p. 21*).

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 the HOLD state.
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 of the Pocket Pump.

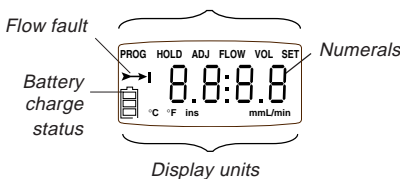
Icons

- Flow Fault: Flashes during flow fault
Battery: Shows battery condition

Display Units

- °C Degrees Celsius. Active when the LCD shows temperature in Celsius scale.
°F Degrees Fahrenheit. Active when the LCD shows temperature in Fahrenheit scale.
ins Inches. Active when the LCD shows the back pressure in inches water.
mm Millimeters. Active when the LCD shows the back pressure in millimeters Hg.
mL/min Milliliters per minute. Active when the LCD shows the flow rate.
min Minutes. Active when the LCD shows run time.

Operating indicators



Flow Fault Icon



Battery Icon

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 running data displayed on the LCD.
- Sets up the pump operation when used with other buttons.

Up and Down Arrow Buttons ▲ ▼

- Increases or decreases either flow (constant flow mode) or pressure (constant pressure mode) during the setup.

Underlined Sequence *▲▼*

- All buttons in that sequence must be pressed within 10 seconds of previous command.

Bracketed Sequence [▲▼]

- All buttons within brackets must be pressed simultaneously.

Security Code *▲▼*

- Pocket Pump operating parameters cannot be changed without pressing the security code sequence.
- The security code may be required at various points during programming.



In this manual, 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.

Operation

Determining Pump Operating States

If the LCD shows:

RUN

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

HOLD

- The pump is off and run time data is stored.
- Temperature and back pressure readings are still active and shown on the LCD.

FLOW FAULT ()

- The pump operation is interrupted due to blocked or restricted flow.
- The flow fault icon will flash and the pump goes into HOLD mode (flow fault icon is steady and HOLD flashes on LCD).
- The pump will restart operation in five minutes and try to continue sampling.
- If flow remains restricted, the pump goes back to HOLD mode (HOLD flashes on LCD) and attempts to restart every five minutes or until the restricted flow is corrected.

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 p. 21*).



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 running in Flow Fault mode is not added to the displayed run time or cumulative volume display.

How to Set Up the Pocket Pump

To activate the pump:

- Press any keypad button. The LCD will show the pump's serial number for two seconds followed by an internal software revision number.

To determine the battery charge:

- The pump will operate for approximately eight hours with a NiCad battery and up to 12 hours with an NiMH battery 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 and appear for *approximately* the first two hours of operation. If using an NiMH battery, this appears for approximately the first three hours of operation.



Two bars indicate main running time and display for *approximately* five hours. If using an NiMH battery, this indicates approximately eight hours.



One bar indicates that there is *approximately* one hour of run time remaining. If using an NiMH battery, this indicates approximately one hour of run time remaining.



When all bars are clear and the outline is flashing, the pump goes into HOLD mode, then to SLEEP mode in approximately one minute.



Pump run time is a converse relationship:

Low flow+Bp=longer run time

High flow+Bp=shorter run time

Operation

To obtain run time data:

- Press the * button. After displaying the data, the pump will return to SLEEP mode in ten seconds. This sequence can be repeated.

To reset the data display to zero:

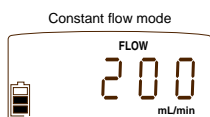
- With the pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) **

The LCD will briefly show the pump serial number, software version number, and run time at 0 min. This will clear all data except the flow setting. *See instructions on page 10 to change the flow setting.*

To determine the pump operating mode (Constant flow or Constant pressure)

- Look at the LCD. Use the * button to scroll through the displays if necessary.

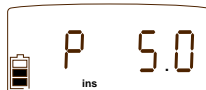


1 to 3 digit number is displayed with "mL/min" and "FLOW"

Standard Display

scrolls through flow, volume, and run time

Multiple tube (constant pressure) mode



1 to 3 digit number is displayed with "P", and an "ins" or "min"

Enhanced Display

scrolls through flow, volume, back pressure, temperature, and run time

To change the operating mode (Constant flow or Constant pressure)

- With the pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) *▼▲*

The display will now show the new operating mode as indicated above.

Note: *If you do not want to clear 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 select pump display:

- **Standard to Enhanced Display:**

With pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) *▲▲*

The enhanced data display will scroll through FLOW, VOLUME, BACK PRESSURE, TEMPERATURE, and RUN TIME.

- **Enhanced to Standard Display:**

With pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) *▼▼*

The standard data display will scroll through 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) scale. Use the * button to scroll to the temperature scale display units.

To change temperature from Celsius (C) to Fahrenheit (F) or Fahrenheit (F) to Celsius (C):

- With pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) [*▼]

The display will show the selected temperature scale.

To select pressure units:

- 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 back pressure units Inches (ins) to Millimeters of Mercury (mm) or Millimeters of Mercury (mm) to Inches (ins):

- With pump running, press:

[▲▼] (HOLD) *▲▼* (Security Code) [▲*]

The display will show the selected pressure unit.



When you see a keypad button sequence that is **underlined** in this manual, press the buttons in that sequence **within 10 seconds of the previous command**.



If a **bracketed sequence** appears, press the keypad buttons in the brackets **simultaneously**.

Operation

Calibrating/Setting the Pump for Constant Flow Applications

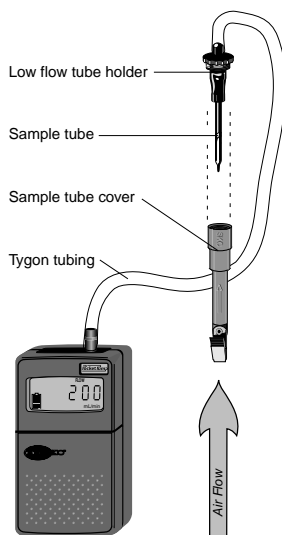
For single sorbent tube and long-duration detector tube sampling:

1. Set the pump for Constant Flow mode (*see page 8*).
2. Connect the pump to either a representative sorbent tube using an SKC tube holder or a long-duration color detector tube using an SKC tandem tube holder and trap tube.



Long-duration Color Detector Tubes require a special tube cover that accommodates an in-line trap tube. The trap tube protects the pump from caustic fumes that are often released from detector tubes. Closely read all precautions when using these tubes. Failure to use the necessary traps will damage the pump and void the warranty.

3. Connect the exposed end of the tube to a primary standard calibrator using another length of tubing.
4. Press [▲▼] for RUN mode.
5. Enter the security code *▲▼▲* within ten seconds. The word **SET** will flash on the LCD.
6. 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 8.
7. Press ▲ or ▼ to change the flow rate to the desired setting.



When calibrating the pump, the flow rate displayed on the **calibrator** will change as a result of adjusting the pump flow rate. The actual pump flow rate (not the display) and the calibrator must ultimately agree.

8. Press *****. The word **ADJ** appears on the LCD. The pump flow rate can now be calibrated using a calibrator.
9. 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 pump and calibrator agree. The flow rate displayed on the **calibrator** will change as a result of adjusting the pump flow rate. The actual pump flow rate (not the display) and the calibrator must ultimately agree.
10. Press ***** to lock in the calibrated flow. The pump will then enter its normal RUN state.
11. Press [**▲▼**] to place the pump in HOLD. Enter [**▲▼**] ***▲▼*** (Security Code) ****** to clear data (minutes that have elapsed during pump setup and/or programming) before sampling.
12. Disconnect the calibration system and replace the representative sample tube with the tube to be used for sampling.
13. Clip sampling medium to a worker's collar in the breathing zone and place the Pocket Pump in the worker's shirt pocket or clip to the worker's belt.
14. Press [**▲▼**] to RUN the pump and begin sampling.
15. Press [**▲▼**] to HOLD the pump and stop sampling. Pump data is retained in memory after sampling is completed. While the pump is in the HOLD mode, use the ***** button to scroll through the data on the LCD.



Protect sample pump from weather when in use outdoors.

Note:

SKC designs its pumps to minimize inherent noise. If the noise level is disturbing when the Pocket Pump is worn in a shirt pocket, SKC recommends clipping the pump on a waist belt.

Operation

Setting the Pump for Multiple Tube Sampling Using Constant Flow Mode

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 Pocket 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 (Catalog 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 multi-tube sampling:

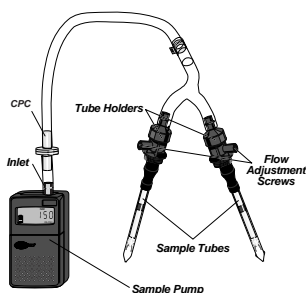
1. Set the pump for Constant Flow mode (*see page 8*) and set it to the selected flow rate (*see page 10-11, steps 4 through 11*). The flow rate of the Pocket Pump must be greater than the sum of the flow rates through the tubes. The sum of the flow rates cannot exceed 200 ml/min to achieve an 8-hour run time (12-hour with NiMH battery).

Example using two tubes:

Tube	Port	Flow (mL/min)
1	A	50
2	B	40

$50 + 40 = 90$. Therefore the flow rate of the Pocket Pump must be greater than 90.

2. Connect the pump inlet to the CPC outlet (the side of the CPC without a label) with a 1/2- to 1-inch length of Tygon® tubing.
3. Connect the inlet side of the CPC (marked “to sample”) to the Adjustable Low Flow Holder.



Note: When multi-tube sampling, the flow rate of the Pocket Pump must be greater than the sum of the flow rates through the tubes. When using the CPC, the sum of the flow rates cannot exceed 200 mL/min to achieve an 8-hour run time with a NiCad battery or a 12-hour run time with an NiMH battery.

Note: When performing multiple tube sampling, the volume display on the LCD is the sum of the volumes drawn through all the tubes.

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. Connect the exposed end of one tube to a primary standard calibrator using another length of tubing.
7. Press [▲▼] to RUN the pump.
8. Turn the flow adjustment screw (needle valve) on the adjustable tube holder until the calibrator matches the selected flow rate through the tube. Note: the flow rate displayed on the calibrator changes as a result of this adjustment.
9. To calibrate each tube’s flow rate, repeat steps 6 through 8 for each port.
10. Press the [▲▼] to place the pump in HOLD mode. Enter [▲▼] *▲▼* (Security Code) ** to reset the data display before sampling.
11. Disconnect the calibration system and replace the representative sample tubes with the tubes to be used for sampling. The pump is ready to run.
12. Clip sampling medium to a worker’s collar in the breathing zone and place the Pocket Pump in the worker’s shirt pocket or clip to the worker’s belt.
13. Press [▲▼] to RUN the pump and begin sampling.
14. Press [▲▼] to HOLD the pump and stop sampling.

Pump data is retained in memory after sampling is completed. While the pump is in the HOLD mode, use the * button to scroll through the data on the LCD.



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



Protect sample pump from weather when in use outdoors.



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

Operation

Setting the Pump for Multiple Tube Sampling Using Constant Pressure Mode

(For use with multi-port adjustable low flow tube holder)

1. Enter enhanced display and Constant Flow mode (*see page 8*). Remain in these modes until ready to calibrate.
2. Connect the pump to an Adjustable Low Flow Tube Holder (*see Optional Accessories, page 28*). Use a screwdriver to turn all of the set screws counter-clockwise until they are flush with the tube holder surface.
3. Label all tubes and ports (e.g., tube #1, port A).
4. 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.
5. Set the desired flow rate (*see page 10-11, steps 4 through 11*) as specified by the method for tube #1 in port (A). Record the flow rate.
6. Press the * button to scroll to Constant Pressure mode (in H₂O or mm Hg). While the pump is in RUN, record the back pressure for that tube. Press [▲▼] to place pump in HOLD.
7. Repeat steps 4 through 6 for each port to obtain each tube's back pressure.



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



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.

- Obtain the calculated back pressure by adding 1 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 H₂O)
1	A	20	6.2
2	B	50	7.9

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

- Insert opened representative tube (#1) back into port (A). Place unopened tubes in remaining port(s) to “seal” them.
- Reset the pump to the desired flow rate for port (A) as done in step 5.
- Press ***** to scroll to Constant Pressure mode (ins or mm). While the pump is still in RUN, use a screwdriver to turn the set screw clockwise for port (A) on the Adjustable Low Flow Tube Holder until it matches the calculated back pressure. Press [**▲▼**] to place the pump in HOLD.
- Repeat steps 9 through 11 for remaining port(s).
- Place pump in Multiple Tube (Constant Pressure) mode by pressing [**▲▼**] (HOLD) ***▲▼*** (Security Code) ***▼▲***.



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

Operation

14. Set pump pressure to the calculated back pressure. From HOLD, press [▲▼] to RUN the pump, then enter the *▲▼* (Security Code) within ten 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.
15. Press ▲ or ▼ to increase or decrease the previously set back pressure setting until it matches the calculated back pressure determined in step 8. Press * to lock in the pressure setting. The pump will then return to its normal RUN state.
16. Clear data (minutes that have elapsed during pump setup and/or programming) before sampling by pressing [▲▼] (HOLD) *▲▼* (Security Code) **.
17. Remove the tubes used for calibration and insert new opened representative tube(s) in their assigned port(s). The pump is now ready to run.
18. Press [▲▼] to RUN the pump and begin sampling.
19. Press [▲▼] to HOLD the pump and stop sampling.

Pump data is retained in memory after sampling is completed. While the pump is in the HOLD mode, use the * button to scroll through the data on the LCD.



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.



Protect sample pump from weather when in use outdoors.

Pump Care and Maintenance

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

- Avoiding dropping the pump or subjecting it to 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.
- Following instructions in the Battery Care and Maintenance section to maximize battery life.



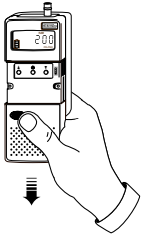
When using the charger, the battery icon displays as a solid outline with three flashing bars (during "fast-charge"). It will then go to a solid outline with three solid bars (during "trickle-charge").



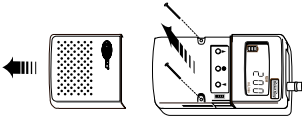
When the battery loses all of its charge, the battery icon displays as a flashing outline with no bars.

Battery Care and Maintenance

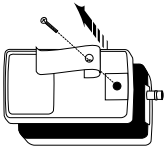
Replacing the Battery Pack



1. Press down on the sliding keypad cover near the SKC logo with your thumb, and push the keypad cover down and away from the display until it is free from the pump.



2. Lay the pump on a flat surface with the LCD facing upwards. Remove the two screws on the front panel of the pump.



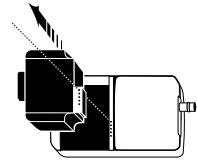
3. Turn the pump over so that the LCD faces down. Remove the belt clip by unscrewing the single locking screw, and remove the battery compartment cover.



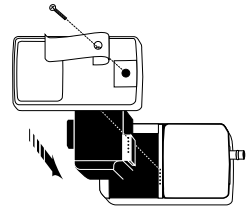
The use of a repaired or rebuilt battery pack voids the SKC warranty and the UL Intrinsic Safety Listing.

Battery Care and Maintenance

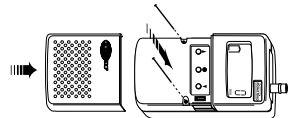
4. Unplug the old battery pack by carefully lifting it upwards, and remove it from the pump.



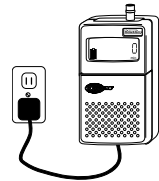
5. Plug in the replacement battery pack. Replace the battery compartment cover and belt clip.



6. Turn the pump over so that the LCD faces upwards. Replace the two screws on the front panel of the pump (do not overtighten the screws) and replace the keypad cover.



7. Charge the new battery pack (see page 21).



Do not charge or operate the pump with the charger in hazardous atmospheres!



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

Battery Care and Maintenance

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:

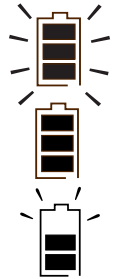
- It allows the battery pack to regulate the charge it receives by reducing its fast charge rate to a trickle charge rate when the battery is at maximum capacity thus preventing damage to the battery.
- It is also designed to prevent harm to the battery by charging only if the battery is within its acceptable 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.

Battery Care and Maintenance

Charging the Battery Pack

To charge the battery, plug the charger into a standard wall outlet and the charging jack into the battery port on the back of the pump. The fast charging function of the battery pack will completely recharge the battery in approximately 6 hours or less when battery pack is attached to the pump. The Pocket Pump battery can be charged detached from the pump, however, it will only accept a slow charge and will charge in approximately 16 hours.

- ◆ 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.
- ◆ 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:
 - Changing ambient temperatures
 - A defective battery pack
 - A disrupted charge cycle



To remove a charging fault, unplug the charger, allow the pump to equilibrate to the ambient temperature, and retry. If the icon display persists, call SKC at 724-941-9701.

FAIL Display

Symptom: Press [▲▼] from Hold mode to Run the pump. Pump will not run and immediately goes back to Hold mode.

Display: Press * to scroll through 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 pump to SKC for repair.



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



Use only SKC-approved batteries and charger to ensure reliable performance and intrinsic safety. Using a non-approved charger voids the SKC warranty and could damage the pump or battery.



Do not charge in hazardous environments.



Ensure that the computer interface port is covered before and during charging.

Battery Care and Maintenance

Discharging Battery Packs

“Memory effect” is a characteristic of Nickel-Cadmium (NiCad) batteries that prevents the batteries from being fully recharged. To eliminate “memory effect,” maximize battery life, and provide optimum performance, completely discharge NiCad batteries after every 40 hours of operation or every 30 days or use a charging system that does not promote memory effect. Nickel Metal Hydride (NiMH) batteries are not likely to develop “memory effect.” Use a charging system that does not promote memory effect for optimum performance.

To discharge the battery pack completely:

1. Enter the Constant Flow mode (*see page 8*).
2. Set the Pocket Pump flow rate to a flow of 225 mL/min (*see pages 10-11, steps 4 through 11*).
3. Allow the pump to run until the battery charge is exhausted.
4. Recharge the battery (*see page 21*).

Continuous Operation Using Charger

Continuous pump operation is possible in **nonhazardous environments** using the pump with battery charger plugged into a wall outlet.

It is important to note that the battery will discharge during a continuous run operation, however, when its charge drops by 50%, the fast charge feature is initiated until the battery receives a full charge. This cycle repeats every several hours during the operation.

Battery Care and Maintenance

Battery Notes and Recommended Maintenance

- *Batteries self-discharge at room temperature. The rate of self-discharge increases with temperature. Ultimately, self-discharge results in an increased need for charging.*
- *NiCad: Self-discharge at an average rate of 18 to 20% per month at room temperature.*
- *NiMH: More sensitive to temperature extremes. Self-discharge 5 to 8% in the first 24 hours before self-discharge stabilizes.*

Recommended Maintenance:

- Cycle battery use on a monthly basis (quarterly for pumps not used on a regular basis).
- "Exercise" your battery pack! Use an SKC battery conditioning system (MasterCharger® or PowerFlex®) that automatically exercises batteries. Perform this procedure before storage and monthly (quarterly for pumps not used on a regular basis).
- Store and charge batteries in the recommended temperature range.
- Discharge and charge battery packs fully before use and storage.

- *Stated battery capacity will not be reached "right out of the box," but only after the battery is exercised. Often new battery packs require 5 to 7 cycles to reach the stated capacity.*

Recommended Maintenance:

"Exercise" your battery! Use an SKC battery conditioning system (MasterCharger or PowerFlex) that automatically exercises batteries. Perform this procedure before storage and monthly (quarterly for pumps not used on a regular basis).

- *Battery packs are typically shipped less than fully charged to meet testing and shipping requirements.*

Recommended Maintenance:

Discharge and recharge battery packs fully before use and storage.

- *A battery should not sit on a charger for long periods of time.*

Recommended Maintenance:

Remove battery pack from its charger within 24 to 48 hours after charging is complete.



For further information on maintaining battery packs, request SKC Publication 1363 (available for download at www.skcinc.com).

Battery Care and Maintenance

Technical Note: Battery Pack Life

- Battery manufacturers typically indicate expected battery life as the number of usable cycles within an approximate number of years (e.g., 300 charge/discharge cycles or 3 years).
- The number of usable cycles/years of useful life for a battery pack is determined by the number of cycles/amount of time it takes for the battery to decline to 80% of its initial capacity when used under ideal conditions. The battery should be replaced at this point.
- Battery life ratings are nominal ($\pm 5\%$) and are generally based on ideal conditions of use such as those in which they are tested (for testing criteria, see IEC 61436 and IEC 61951 test methods at www.iec.ch).
- Individual conditions of use, charging procedures, and applications (high versus low current drain, intermittent versus steady current drain) may affect length of battery life.
- While NiMH batteries provide longer run times than NiCad batteries on a single charge, the user can expect less cycles life from an NiMH battery when compared to NiCad cycles life.

Service Policy

To return products to SKC for servicing:

1. Call 800-752-8472 (724-941-9701 for international customers) to obtain a Return Materials Authorization (RMA) number and Product Decontamination Form.
2. Carefully package the product. Mark the RMA number on any correspondence relating to the return and on the outside of the package.
3. Ship to SKC, freight prepaid, to the following address:

SKC Inc.
National Service Center
863 Valley View Road
Eighty Four, PA 15330

Package product carefully to prevent damage during transit. Include a contact name, phone number, shipping address, RMA number, and a brief description of the problem. For nonwarranty repairs, a purchase order number and billing address are also required. The Service Department will contact nonwarranty customers with an estimate before proceeding with repairs.

Note: *SKC Inc. will accept for repair any SKC product that is not contaminated with hazardous materials. Products determined to be contaminated will be returned unserviced.*



SKC Inc. will accept for repair any SKC product that is not contaminated with hazardous materials. Products determined to be contaminated will be returned unserviced.



Use only SKC-approved parts to ensure reliable performance and maintain the SKC warranty.



The use of a repaired or rebuilt battery pack voids the SKC warranty and the UL Intrinsic Safety Listing.

Accessories

DataTrac Software

With the optional DataTrac 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, timed stop, and intermittent sampling, 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 the Pocket Pump's flow to a primary standard
- Display the operating mode including Constant Flow or Constant Pressure, temperature, run time, and battery status
- Create and save a Pocket Pump program without the pump being connected to a PC
- Program up to fourteen sampling sequences, each with different flow rates
- Download pump run time data and history to a PC
- Create chain-of-custody information 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 System Requirements

- CD drive
- 800 x 600 (SVGA) resolution
- Available 9- or 25-pin serial port, i.e., a com port not used by a mouse, modem, or other device
- Mouse
- Microsoft® Windows® 98 or higher

With DataTrac Software you can...

Create a sample sheet for worker & sample information

Mode	Rate	Start Date	Start Time	Volume (Liters)	Accum Volume	Duration
Flow Hold		Oct 3 1995	12:06 PM	0.200	0.200	1 Hr 36 Min
Flow	200	Oct 3 1995	1:42 PM	0.200	0.200	1 Min
Flow Hold		Oct 3 1995	1:43 PM			1 Hr 26 Min

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

Flow Calibrates

DataTrac Software

Includes software on CD, adapter, and cable.

Cat. No. 877-90

Accessories

Optional Accessories

Description	Cat. No.
Chargers	
PowerFlex Charging System for SKC Personal Pumps	
5-station, 100 - 240 V	223-1000
Single, 120 V	223-2000
Single, 100 - 240 V	223-2000B
DataTrac Software Package	
Includes software CD, adapter, and cable (<i>see pages 26 and 27 for details</i>)	877-90
Replacement Parts	
Battery Pack (NiCad)	P20129-1
Battery Pack (NiCad) ATEX model	P20129TX
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 L)	222-3-1
Type B (tubes 8 mm OD x 110 mm L)	222-3L-1
Type C (tubes 10 mm OD x 150 mm L)	222-3XL-1
Type T (tandem style for color detector tubes up to 115 mm long and a trap tube)	222-3D-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 L)	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 T (tandem style for color detector tubes up to 115 mm long and a trap tube)	224-29T
Long-duration Detector Tube Sampling:	
Trap Tubes	222-3D-2
Tandem Protective Tube Cover	224-29T
Type T Sample Tube Holder	222-3D-1



Use only SKC-approved parts to ensure reliable performance and intrinsic safety and to maintain the SKC

SKC INC. LIMITED ONE YEAR WARRANTY

1. SKC warrants that its instruments provided for industrial hygiene, environmental, gas analysis, and safety and health applications are free from defects in workmanship and materials under normal and proper use in accordance with operating instructions provided with said instruments. The term of this warranty begins on the date the instrument is delivered to the buyer and continues for a period of one (1) year.

This warranty does not cover claims due to abuse, misuse, neglect, alteration, accident, or use in application for which the instrument was neither designed nor approved by SKC Inc. This warranty does not cover the buyer's failure to provide for normal maintenance, or improper selection or misapplication. This warranty shall further be void if changes or adjustments to the instrument are made by other than an employee of the seller, or if the operating instructions furnished at the time of installation are not complied with.

2. SKC Inc. hereby disclaims all warranties either expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose, and neither assumes nor authorizes any other person to assume for it any liability in connection with the sale of these instruments. No description of the goods being sold has been made a part of the basis of the bargain or has created or amounted to an express warranty that the goods will conform to any such description. Buyer shall not be entitled to recover from SKC Inc. any consequential damages, damages to property, damages for loss of use, loss of time, loss of profits, loss of income, or other incidental damages. Nor shall buyer be entitled to recover from SKC Inc. any consequential damages resulting from defect of the instrument including, but not limited to, any recovery under section 402A of the Restatement, Second of Torts.

3. This warranty extends only to the original purchaser of the warranted instrument during the term of the warranty. The buyer may be required to present proof of purchase in the form of a paid receipt for the instrument.

4. This warranty covers the instrument purchased and each of its component parts.

5. In the event of a defect, malfunction, or other failure of the instrument not caused by any misuse or damage to the instrument while in possession of the buyer, SKC Inc. will remedy the failure or defect without charge to the buyer. The remedy will consist of service or replacement of the instrument. SKC Inc. may elect refund of the purchase price if unable to provide replacement and repair is not commercially practicable.

6. (a) To obtain performance of any obligation under this warranty, the buyer shall return the instrument, freight prepaid, to SKC Inc., at the following address:

SKC Inc., National Service Center
863 Valley View Road
Eighty Four, PA 15330 USA

(b) To obtain return authorization information or for further information on the warranty performance you may telephone 724-941-9701 at the above address. See Service Policy section in operating manual (if applicable).

7. This warranty shall be construed under the laws of the Commonwealth of Pennsylvania which shall be deemed to be the situs of the contract for purchase of SKC Inc. instruments.

8. No other warranty is given by SKC Inc. in conjunction with this sale.

UL Certificate

333 Plingsten Road
Northbrook, Illinois 60062-2096
(847) 272-8800
FAX No. (847) 272-8129
MCI Mail No. 254-3343
Telex No. 6502543343



Underwriters Laboratories Inc.®

CERTIFICATE No. Ex.020196-62011-1
2 January 1996

Issued to: SKC, Inc.
863 Valley View Road
Eighty Four, PA 15330



This is to certify that: Intrinsically safe portable air sampling pump, "Pocket Pump", Model 210-1002 when used with self-contained SKC 2.4V battery pack, Part No. P20129 has been investigated by Underwriters Laboratories Inc. in accordance with the Standard indicated in this certificate.

UL Standard for Safety:

ANSI/UL 913-1988, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1 Hazardous Locations, Fourth Edition.

The air sampling pump complies with the requirements as defined by the standard indicated in this document for intrinsically safe apparatus for use in Class I, Division 1 and 2, Groups A, B, C, and D, Class II, Division 1 and 2, Groups E, F, and G, and Class III Hazardous Locations.

To establish that the product is under the Certification program, it is necessary to determine that the Listing Mark is affixed to the product. Only those products bearing the appropriate Listing Mark and the company's name, trade name, trademark, or other recognized identification should be considered as covered by UL's Listing and Follow-Up Service. The Listing Mark includes the symbol of Underwriters Laboratories Inc., "®", together with the word "Listed" and the control number 124U.

Code: Intrinsically safe apparatus: Class I, Division 1 and 2, Groups A, B, C, D; Class II, Division 1 and 2, Groups E, F, G; and Class III, Hazardous Locations.

Temperature Code: T3C

T amb = 40°C

Revision No. 1
Investigation and Test
Report Reference:
E62011, 12 December 1995

F. J. Cleary
Senior Engineering Associate
Hazardous Locations
Engineering Services

A not-for-profit organization
dedicated to public safety and
committed to quality service

AC Charger	20	HOLD	6
Accessories	26	Keypad	5
Activate Pump	7	Star button	5
ADJ Indicator	4,11	Up & Down Arrow buttons	5
Adjustable Low Flow		LCD	4
Tube Holders	12,14	Color Detector Tubes (Long Duration) ...	10
Arrow Buttons	5	Multiple Tube Sampling	12-16
Back Pressure	15	Operating Indicators	4
Battery		ADJ	4
Charging	20-21	FLOW	4
Determining Charge	7	HOLD	4
Discharging	22	PROG	4
Fast-Charge	21	SET	4
Icons	4,7,21	VOL	4
Maximizing	19	Operating Modes	8
Notes	23-24	Constant Flow	8,10
Memory Effect	22	Constant Pressure	8,14
Replacing	18-19	Operating States	6
Trickle-Charge	20	Flow Fault	6
Bracketed Button Sequence	5	HOLD	6
Button		RUN	6
Arrow	5	SLEEP	6
Star	5	Pressure Units	9
Sequence	5	ins H ₂ O	9
Calibration		mm Hg	9
Constant Flow	10-13	PROG Indicator	4
Constant Pressure	14-16	Replacing Battery Pack	18
Charging Battery	20-21	Resetting Data Display	8
Clearing Data Display	8	RUN	6
Constant Flow		Sampling	
Applications	10-13	Constant Flow	10
Mode	8	Constant Pressure	14
Constant Pressure		Constant Pressure Controller	12
Applications	14-16	Color Detector Tube	10
Mode	8,14	Sorbent Tube (Single)	10
Continuous operation	22	Sorbent Tube (Multiple) in	
CPC	12	Constant Pressure Mode	14
DataTrac Software	26-27	Sorbent Tube (Multiple) using	
Discharging Battery	22	Constant Pressure Controller	12
Display		Security Code	5
Data	4, 9	Service Policy	25
Enhanced	8-9	SET Indicator	10
Pressure	9	SLEEP	6
Resetting	8	Smart Charging Battery System	20
Standard	8-9	Sorbent Tube Sampling (Single)	10
Temperature	9	Sorbent Tube Sampling (Multiple) ...	12,14
Display Units	4	Specifications (Performance Profile) ...	2-3
°C	4	Standard Display	8-9
°F	4	Star Button	5
ins	4	Temperature Scale	9
min	4	Trickle-Charge	20
mL/min	4	UL Certificate	30
mm	4	Underlined Button Sequence	5
Enhanced Display	9	Up and Down Arrow Buttons	5
Fast-Charge	21	Warranty	29
Flow Fault	6		
Icon	4, 6		
Flow Rate			
Changing	10-11		