Operating Instructions

Universal Sample Pump

Catalog No. 224-PCXR4

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

Form #37712 Rev 1001

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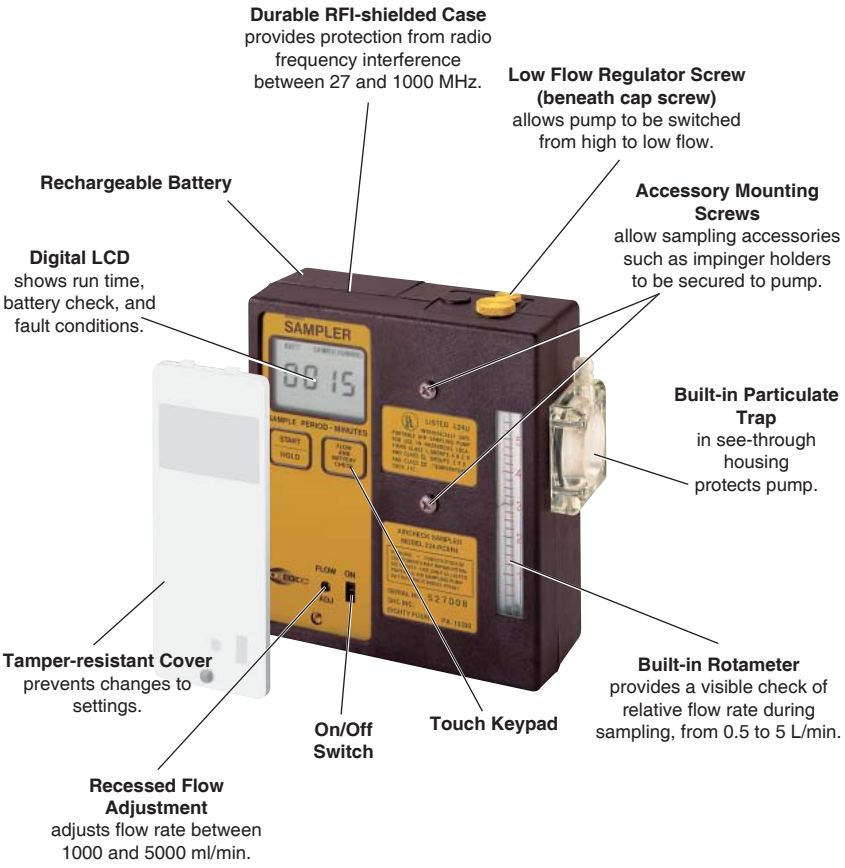
Indicates a warning or caution

Indicates a premier feature of the pump

Universal Sample Pump Operating Instructions
are also available in Spanish, German, and French Canadian.

Description

The PCXR4 Universal Sample Pump is a constant flow air sampler suitable for a broad range of applications. It is ideal for industrial hygiene studies as well as environmental testing.



PCXR4 Universal Sample Pump

Performance Profile

Flow Range: 1000 to 5000 ml/min (UL Listed model)
(5 to 500 ml/min requires adjustable low flow holder)

Weight: 34 oz (964 gm)

Dimensions: 5.1 x 4.7 x 1.9 in (13 x 11.9 x 4.8 cm)

Compensation Range: 1000 to 2500 ml/min at 40 inches water back pressure
3000 ml/min at 35 inches water back pressure
4000 ml/min at 20 inches water back pressure
5000 ml/min at 10 inches water back pressure

Typical Back Pressure of Sampling Media (*inches water*)

Flow Rate (L/min)	1.0	1.5	2.0	2.5
Filter/Pore Size (µm)				
25-mm MCE, 0.8	6	9	12	15
25-mm MCE, 0.45	14	22	28	35
37-mm MCE, 0.8	2	3	4	5
37-mm PVC, 5.0	1	1	2	2

Compare the information in this table to pump compensation range to determine appropriate applications.

Flow Control: Holds constant flow to ± 5% of the set point

Run Time: **NiCad Battery:** 8 hrs minimum at 4000 ml/min and 20 inches water back pressure; *dependent on media used. See Table 1 on page 4.*
NiMH Battery: 12 hrs minimum at 4000 ml/min and 20 inches water back pressure; *dependent on media used. See Table 2 on page 4.*
Battery Eliminator: Pump provides extended runs.

Flow Indicator: Built-in rotameter with 250-ml division; scale marked at 1, 2, 3, 4, and 5 L/min

Power Supply: **6.0-V plug-in NiMH battery pack,** rechargeable, 3.5-Ah capacity or **6.0-V plug-in NiCad battery pack,** rechargeable, 2.0-Ah capacity
A **battery eliminator** is available (*see Optional Accessories*); use voids the UL Listing for intrinsic safety.

Charging Time: 6 to 8.5 hrs with PowerFlex charger
(varies with battery capacity and level of discharge)

Intrinsic Safety: UL Listed for: Class I, Division 1 and 2, Groups A, B, C, D; Class II, Division 1 and 2, Groups E, F, G; and Class III, Temperature Code T3C
MSHA-approved models available. Contact SKC.
ATEX-approved models available. Contact SKC.

Operating Temperature: 32 to 113 F (0 to 45 C)

Storage Temperature: -4 to 113 F (-20 to 45 C)

Charging Temperature: 50 to 113 F (10 to 45 C)

Operating Humidity: 0 to 95% non-condensing

Protect sample pump from weather when in use outdoors.

Multiple-tube Sampling: Built-in constant pressure regulator allows user to take up to four simultaneous tube samples at different flow rates up to 500 ml/min each using optional adjustable low flow holder.

RFI/EMI Shielding: Complies with requirements of EN 55022, FCC Part 15 Class B, EN 50082-1; frequency range of the radiated susceptibility test was 27 to 1000 MHz.

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 pump stops, displays FLOW FAULT, pauses timing functions, and displays elapsed time. Auto-restart is attempted up to 5 times.

Low Battery Fault: Pump stops, displays LO BATT, pauses timing functions, and displays elapsed time.

Battery Test: LCD shows battery condition prior to sampling.

Time Display: LCD displays up to 9999 minutes (6.8 days) at which point the display rolls over to 0.

Timing Accuracy: ± 0.05% (± 45 seconds per day)

Sampling Pause (Hold): Allows user to temporarily halt sampling without loss of timing data. Restart does not require resetting time.

CE marked

UL Listed

ATEX-approved models available

MSHA-approved models available

Table 1. Pump Run Time in Hours with NiCad Battery

Following are typical run times achieved when using a fully charged nickel-cadmium (NiCad) battery pack. Data is sorted by type of sample media. All run times are listed in hours. Results obtained using a new pump and new fully charged battery. Pump performance may vary.

Mixed Cellulose (MCE) filter, 0.8-µm pore size

	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	24.1	16.3
2.5	21.4	14.5
3.0	19.1	11.0
3.5	17.8	10.7
4.0	15.4	**
4.5	14.6	**

Polyvinyl Chloride (PVC) filter, 5.0-µm pore size

	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	31.6	21.7
2.5	27.7	24.0
3.0	27.0	18.6
3.5	22.8	16.4
4.0	19.4	16.2
4.5	19.0	14.6

** Filter back pressure exceeded pump capability during testing.

Note *Increases in back pressure during sampling due to buildup of sample on the filter can decrease battery life.*

Table 2. Pump Run Time in Hours with NiMH Battery

Following are typical run times achieved when using a fully charged nickel-metal hydride (NiMH) battery pack. Data is sorted by type of sample media. All run times are listed in hours. Results obtained using a new pump and new fully charged battery. Pump performance may vary.

Mixed Cellulose (MCE) filter, 0.8-µm pore size

	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	37	33
2.5	34	26
3.0	31	21
3.5	29	18
4.0	25	15
4.5	20	14

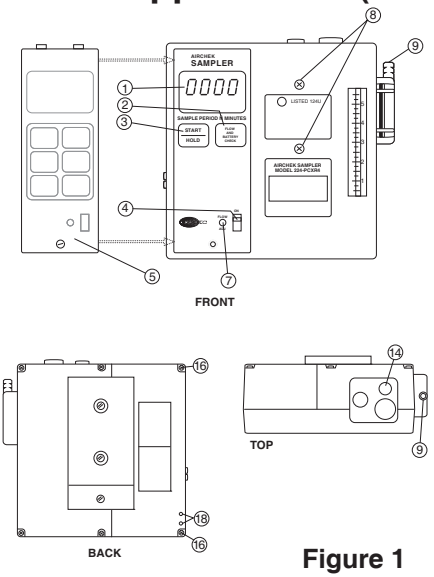
Polyvinyl Chloride (PVC) filter, 5.0-µm pore size

	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	47	41
2.5	38	33
3.0	35	30
3.5	26	27
4.0	22	25
4.5	21	23

Note *Increases in back pressure during sampling due to buildup of sample on the filter can decrease battery life.*

Operation

High Flow Applications (1000 to 5000 ml/min)



1 LCD

2 Flow and Battery Check Key

3 Start/Hold Key

4 On/Off Switch

5 Tamper-resistant Cover

7 Flow Adjustment Screw

8 Accessory Mounting Screws (2)

9 Intake/Filter Housing

14 Cap Screw to Regulator

16 Battery Pack Screws (2)

18 Charging Jack

Figure 1

Front, back, and top views of PCXR4 Sampler

For additional drawings, see pages 21 and 23.

Setup

Install battery (*see Installing the Battery Pack on page 18*). For optimum charging, ensure pump is **not** running. Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #18). Ensure that the battery is fully charged before sampling.

Charger and battery connected

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.

Do not charge or operate pump from charger in hazardous locations.

Use only an SKC-approved charger designated for this model to ensure reliable performance. Failure to do so voids any warranty.

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.

Failure to follow warnings and cautions voids any warranty.

1

2

De-activating the Regulator

To ensure the pump is set for high flow, remove the cap screw (Figure 1, #14) covering the regulator valve and turn the exposed screw clockwise until it stops. (Do not overtighten.)

Replace the cap screw. The pump is now set for high flow.

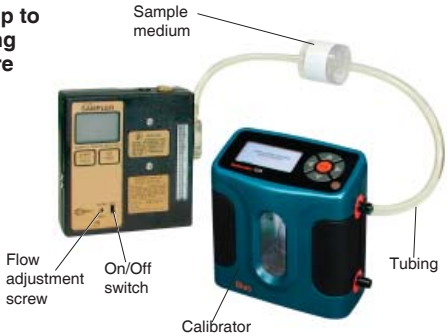
For high flow, turn valve screw clockwise.

Setting or Verifying Flow Rate

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Ensure pump has run for 5 minutes before proceeding with calibration.

Using 1/4-inch Tygon® tubing, connect the sampling medium to the pump intake (Figure 1, #9).



Calibration train with filter cassette

3

Remove the tamper-resistant cover. Start the pump using the on/off switch (Figure 1, #4). Press Start/Hold (Figure 1, #3). Press Flow and Battery Check (Figure 1, #2). Adjust flow using the flow adjustment screw (Figure 1, #7) until the built-in rotameter reads 2 L/min. The LCD should indicate BATT OK in the upper left corner (if it doesn't, recharge battery). Press Flow and Battery Check to place pump in Hold.

Connect a calibrator to the intake of the sampling medium.

Press Flow and Battery Check to start pump, and set the flow rate using the flow adjustment screw (Figure 1, #7).

When the flow rate is set, press Flow and Battery Check to place pump in Hold. Disconnect the calibrator.

Replace the sampling medium used for calibration with an unexposed medium for sample collection.

Sampling

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Protect 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 and any warranty.

Clip sample medium to worker and pump to belt.

For personal sampling, clip the sample collection media to the worker in the breathing zone.

While the LCD displays HOLD, start sampling by pressing Start/Hold. SAMPLE RUNNING will display. Record the start time. The LCD will automatically track sampling period time elapsed.

4

At the end of the sampling period, press Start/Hold and record the stop time.

User Options During Sampling

Pause - Pause (shutdown) the pump by pressing Start/Hold. All timing data will freeze. To resume sampling, press Start/Hold; timing data will resume.

Flow or Battery Fault Shutdown - If the pump is unable to compensate due to excessive back pressure or a low battery condition exists the sampler will shut down. HOLD will display on the LCD and timing functions will pause, but continue to display elapsed time. LO BATT or FLOW FAULT will display on the LCD depending on the cause of the shutdown. Fifteen seconds after flow fault shut down, the pump will attempt to restart up to 5 times. To restart from flow fault, correct the blockage and press Start/Hold. If LO BATT is displayed, recharge the battery before sampling.

continued on page 8

4

cont'd

Sampling with Impingers

When using impingers, place an in-line trap between the pump and the impinger to protect the sampler from liquid or vapors. The impinger and trap can be mounted to the sampler using the accessory mounting screws (Figure 1, #8) or placed in a holster at the worker's waist.

Impinger holder on pump with impinger and trap

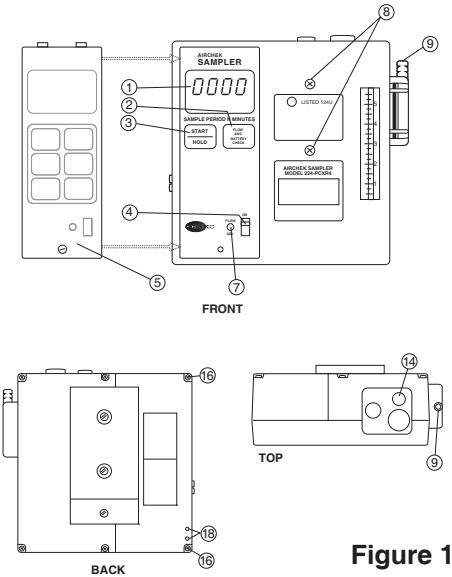
Failure to use the impinger trap voids any warranty.

Protect 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 and any warranty.

Low Flow Applications (5 to 500 ml/min)

Using Single Adjustable Low Flow Holder



1 LCD

2 Flow and Battery Check Key

3 Start/Hold Key

4 On/Off Switch

5 Tamper-resistant Cover

7 Flow Adjustment Screw

8 Accessory Mounting Screws (2)

9 Intake/Filter Housing

14 Cap Screw to Regulator

16 Battery Pack Screws (2)

18 Charging Jack

Figure 1

Front, back, and top views of PCXR4 Sampler

For additional drawings, see pages 21 and 23.

Setup

Install battery (*see Installing the Battery Pack on page 18*). For optimum charge, ensure pump is **not** running. Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #18). Ensure that the battery is fully charged before sampling.

Charger and battery connected

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.

Do not charge or operate pump from charger in hazardous locations.

Use only an SKC-approved charger designated for this model to ensure reliable performance. Failure to do so voids any warranty.

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.

Failure to follow warnings and cautions voids any warranty.

1

2

Activating the Regulator

Remove the tamper-resistant cover. Start the pump using the on/off switch (Figure 1, #4). Press Start/Hold (Figure 1, #3). Press Flow and Battery Check (Figure 1, #2). Adjust flow using the flow adjustment screw (Figure 1, #7) until the built-in rotameter reads 1.5 L/min. The LCD should indicate BATT OK in the upper left corner (if it doesn't, recharge the battery). Press Flow and Battery Check to place the pump in Hold.

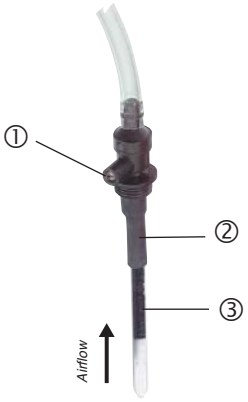
For low flow, turn valve screw counterclockwise.

Remove the cap screw covering the regulator valve (Figure 1, #14) and turn the exposed screw four to five turns counterclockwise.

Replace the cap screw. The pump is now set for low flow.

Setting or Verifying Flow Rate

For a diagram of the pump, see Figure 1, page 5.



1 Flow adjust screw

2 Rubber sleeve

3 Sorbent tube

Figure 2
Single Adjustable Low Flow Holder with sample tube

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Ensure pump has run for 5 minutes before proceeding with calibration.

3

Connect a single adjustable low flow holder (Figure 2) to the pump intake (Figure 1, #9) using 1/4-inch Tygon tubing.

Insert an opened sorbent tube (Figure 2, #3) into the rubber sleeve (Figure 2, #2) of the low flow holder with the arrow on the tube pointing toward the holder.

Connect a calibrator to the exposed end of the sorbent tube.

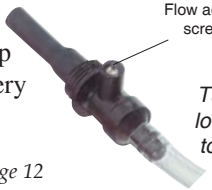
Loosen the brass flow adjust screw on the low flow holder. Activate the pump by pressing Flow and Battery Check.

Adjust the flow rate by turning the flow adjust screw (Figure 2, #1) on the holder until the calibrator indicates the desired flow.

Calibration train with tube in low flow holder

Do not adjust the flow on the pump. Adjust the flow only by using the flow adjust screw on the low flow holder.

When the desired flow is set, place pump in Hold by pressing Flow and Battery Check. Disconnect the calibrator.



Turn screw on low flow holder to adjust flow.

continued on page 12

3 *cont'd*

Replace the sorbent tube used for setting the flow with a new unexposed sorbent tube for sample collection.

Place the appropriate size tube cover over the tube, and screw it into place on the low flow holder.

Sampling

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Protect 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 and any warranty.

Clip holder to worker and pump to belt.

4

For personal sampling, clip the low flow holder to the worker in the breathing zone.

While the LCD displays HOLD, start sampling by pressing Start/Hold. SAMPLE RUNNING will display. Record the start time. The LCD will automatically track sampling period time elapsed.

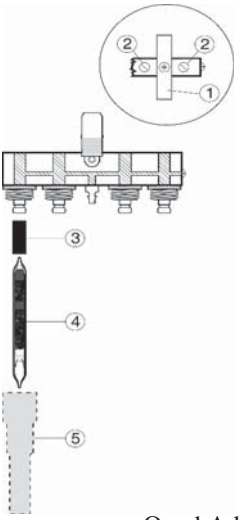
At the end of the sampling period, press Start/Hold and record the stop time.

To return to high flow, remove the low flow holder and de-activate the regulator. *See page 6.*

For user options during sampling, see page 7.

Low Flow Applications (5 to 500 ml/min)

Using Multiple-tube Adjustable Low Flow Holder



1 Anti-tamper Cover

2 Flow Adjust Screws

3 Rubber Sleeve

4 Sorbent Sample Tube

5 Protective Cover

Figure 3
Quad Adjustable Low Flow Holder

Setup

For a diagram of the pump, see Figure 1, page 5.

Install battery (*see Installing the Battery Pack on page 18*). For optimum charge, ensure pump is **not** running. Charge the battery by connecting the charger plug to the sampler charging jack (Figure 1, #18). Ensure that the battery is fully charged before sampling.

Charger and battery connected

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.

Do not charge or operate pump from charger in hazardous locations.

Use only an SKC-approved charger designated for this model to ensure reliable performance. Failure to do so voids any warranty.

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.

Failure to follow warnings and cautions voids any warranty.

1

Setting or Verifying Flow Rate

When performing multiple-tube sampling using an adjustable low flow holder (dual, tri, or quad), ensure the regulator has been activated and the pump flow rate is set at 1.5 L/min. The maximum flow rate through any one tube is 500 ml/min*. Calculate the sum of all tube flow rates. If the sum is ≤1000 ml/min, proceed with calibration and sampling without any further adjustment to the pump flow rate. If the sum is >1000 ml/min, set the pump flow rate 15% higher than the sum of tube flow rates.

* *Back pressure across some sample tubes can be higher than average. In these instances, the maximum flow rate of 500 ml/min per tube may not be achieved.*

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Ensure pump has run for 5 minutes before proceeding with calibration.

Ensure the pump is set for low flow. *See Activating the Regulator, page 9.*

2

Connect the adjustable low flow holder (Figure 3, page 13) to the pump intake (Figure 1, #9) using 1/4-inch Tygon tubing.

Insert an opened sorbent tube into each rubber sleeve of the low flow holder (Figure 3, #3 and 4) with the arrow on the tube pointing toward the holder.

If sampling with fewer tubes than number of ports, insert unopened sorbent tubes in the empty ports to seal them.

Connect holder to pump intake and tube inlet to calibrator.

Note the flow rates specified by each sampling method and add them together. If the sum is ≤1000 ml/min, proceed to the next step. If the sum is >1000 ml/min, multiply the total tube flow rate by 1.15 and set the pump for that flow rate.

Connect a calibrator to the exposed end of a sorbent tube, loosen the brass flow adjust screw on the low flow holder, and activate the pump by pressing Flow and Battery Check.

continued on page 15

Turn the flow adjust screw (Figure 3, #2) for the appropriate port of the low flow holder until the desired flow rate is achieved through the tube. Turn clockwise to decrease the flow.

Do not adjust the flow on the pump. Adjust the flow only by using the flow adjust screw on the low flow holder.

Do not exceed 500 ml/min flow rate per tube.

When the desired flow is set on the initial tube, place pump in Hold by pressing Flow and Battery Check. Remove the calibrator from the tube and connect to the exposed end of the next sorbent tube. Press Flow and Battery Check and repeat the flow adjustment process until all tubes are flow calibrated. Changing the flow on one tube will not affect the flow rate through the remaining tubes.

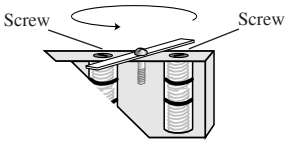


Figure 4 -
Cut-away of Tri/Quad Low Flow Holder

2
cont'd

Do not exceed 500 ml/min flow rate per tube.

For tri and quad models, first rotate each anti-tamper cover (Figures 3 [*on page 13*] and 4) to expose the flow adjust screws, then adjust the appropriate screw until calibrator indicates the desired flow.

When the flow rate is set for each tube, press Flow and Battery Check to place the pump in Hold and disconnect the calibrator.

Replace the sampling media used for calibration with unexposed media for sample collection. Use a protective tube cover to prevent tube breakage.

If sampling with fewer tubes than number of ports, insert unopened sorbent tubes in the empty ports to seal them.

3

Sampling

Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

Protect 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 and any warranty.

Clip holder to worker and pump to belt.

For personal sampling, clip the low flow holder to the worker in the breathing zone.

While the LCD displays HOLD, start sampling by pressing Start/Hold. SAMPLE RUNNING will display. Record the start time. The LCD will automatically track sampling period time elapsed.

At the end of the sampling period, press Start/Hold and record the stop time.

To return to high flow, remove the low flow holder and deactivate the regulator. *See page 6*.

For user options during sampling, see page 7.

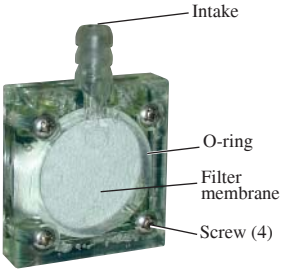
Maintenance

Pump Inlet Filter

The PCXR4 Sampler is fitted with a filter/trap inside a clear plastic intake port housing. This prevents particles from being drawn into the pump mechanism. The filter should be visually checked to assure that it does not become clogged. If maintenance is necessary, follow this procedure:

1. Clean dust and debris from around the filter housing.
2. Remove the four screws and the front filter housing.
3. Remove and discard the filter membrane.
4. Remove O-ring.
5. Clean the filter housing.
6. Insert O-ring* and a new filter membrane. *See Replacement Parts, pages 22-23.*
7. Reattach the front filter housing and cross-tighten the four screws.

** Replace with new O-ring only as needed.*



Close-up of inlet filter housing

Battery Pack Care

For proper maintenance of battery packs, SKC offers chargers (*see Optional Accessories, page 24*) that condition the battery for optimum performance in 6 to 8.5 hours. For optimum charge, ensure pump is **not** running during charging. Follow charger instructions.

Fully charge packs before use. *For more information on SKC pump batteries, visit http://www.skcinc.com/instructions/1756.pdf.*

To comply with intrinsic safety regulations, do not charge or operate the pump from the charger in hazardous locations.

Using a non-approved charger voids any warranty.

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

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

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.

Failure to follow warnings and cautions voids any warranty.

Installing the Battery Pack

To enhance battery life, SKC ships battery packs separate from the pump. Once installed, completely charge battery pack before operating pump.

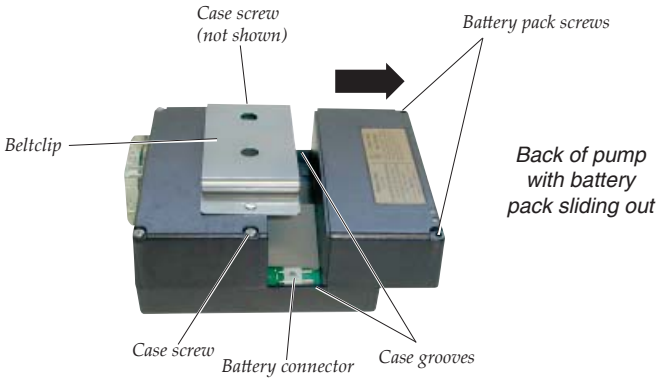
1. Loosen the two case screws above and below the belt clip.
2. Slip the front edge of the battery pack under the belt clip and position battery pack to engage the grooves in the case.
3. Slide battery pack toward the pump until it is flush with the pump case on all sides.
4. Install two battery screws and tighten the case screws loosened in Step 1.
5. Charge battery completely. For optimum charge, ensure pump is not running during charging.

Replacing the Battery Pack

To enhance battery life, SKC ships battery packs separate from the pump. Once installed, completely charge battery pack before operating pump.

For information on SKC pump batteries, visit www.skcinc.com/instructions/1756.pdf.

1. Remove the two screws that secure the battery pack and loosen the two case screws above and below the belt clip.
2. Carefully slide battery pack out from under the belt clip. Ensure that the battery is kept level.
3. Slip the front edge of the new battery pack under the belt clip and position battery pack to engage the grooves in the case.
4. Slide the battery pack toward the pump until it is flush with the pump case on all sides.
5. Reinstall battery screws and tighten the case screws.



Important Cautions/Warnings on next page

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

Do not charge or operate the pump from the charger in hazardous locations!

Use only an SKC-approved charger and battery pack designed for the Universal Sample Pump to ensure reliable performance. Failure to do so voids any warranty and UL Listing for intrinsic safety.

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

Pump Service

Pumps under warranty should be sent to SKC Inc. for servicing.
See Service Policy, page 25.

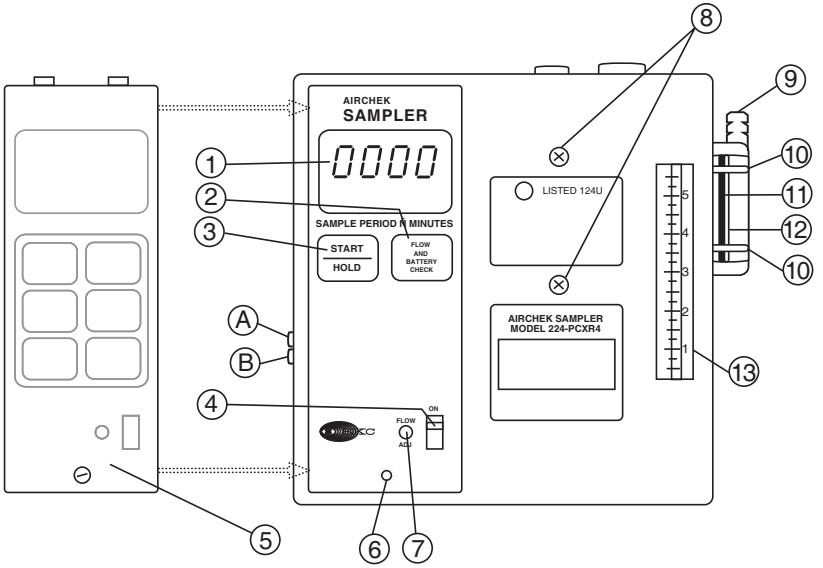
Parts Descriptions

Use only SKC-approved parts to ensure reliable performance. Failure to do so voids any warranty and UL Listing for intrinsic safety.
See page 21 for drawing.

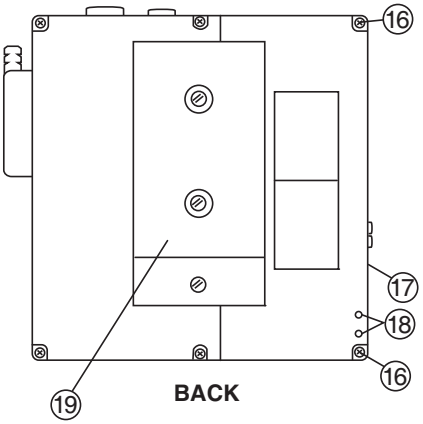
No.	Description
1	**LCD** indicates all sampler functions.
2	**FLOW AND BATTERY CHECK Key** allows flow rate setting and battery condition testing.
3	**START/HOLD Key** is used to start the sampling cycle, pause the sampling cycle, and restart the cycle after pause.
4	**ON/OFF Switch** shuts down the pump completely and clears time display.
5	**Tamper-resistant Cover** protects controls from incidental contact or tampering.
6	**Cover Screw** fastens tamper-resistant cover.
7	**Flow Adjustment Control** adjusts flow from 1000 to 5000 ml/min.
8	**Accessory Mounting Screws (2)** secure accessories such as impinger and trap holders.
9	**Intake/Filter Housing** air intake port and trap
10	**Filter Housing Screws (4)** secure filter housing
11	**Filter O-ring -** leak seal for filter in housing
12	**Filter (crimped fiber polyester)** prevents particles from entering pump.
13	**Built-in Flowmeter** monitors flow changes.
14	**Cap Screw** accesses regulator.
15	**Cap Screw** accesses air discharge port.
16	**Battery Pack Screws (2)** secure pack to pump.
17	**Battery Pack Assembly** provides power to pump.
18	**Charging Jack,** connector for battery charger
19	**Belt Clip** secures pump to worker.
A	**Compensation Pot A** adjusts pump compensation, which is factory set. Access screw guards against accidental contact or tampering.
B	**Compensation Pot B** adjusts pump compensation, which is factory set. Access screw guards against accidental contact or tampering.

224-PCXR4 Sample Pump

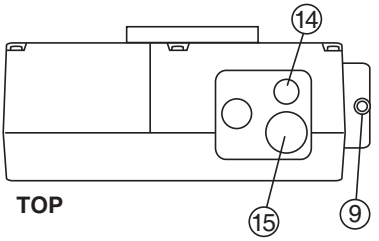
See page 20 for parts listing.



FRONT



BACK



TOP

Replacement Parts

See drawings on page 23.

Pump Case Parts

P21411	Case Parts (excluding Battery Case)
P21661MH	Battery Pack Assembly, NiMH
P21661	Battery Pack Assembly, NiCad
P22417BC	Belt Clip with screws
P22433N	Keyboard Assembly
P22433R	Cap Screws (set of 2)
P22433T	Control Board
P22433RS2	Replacement Stack - does not include flowmeter and filter housing assemblies or motor

Pump Stack Parts

P22417D	Filter Housing Assembly
P22417E	Pressure Switch Assembly
P22417F	Valve Plate Assembly
P22417G	Pump Body
P22417H	Diaphragm/Yoke Assembly
P22417J	Regulator Assembly
P22417K	Pulsation Dampener Assembly (2)
P22433L	Flowmeter Assembly

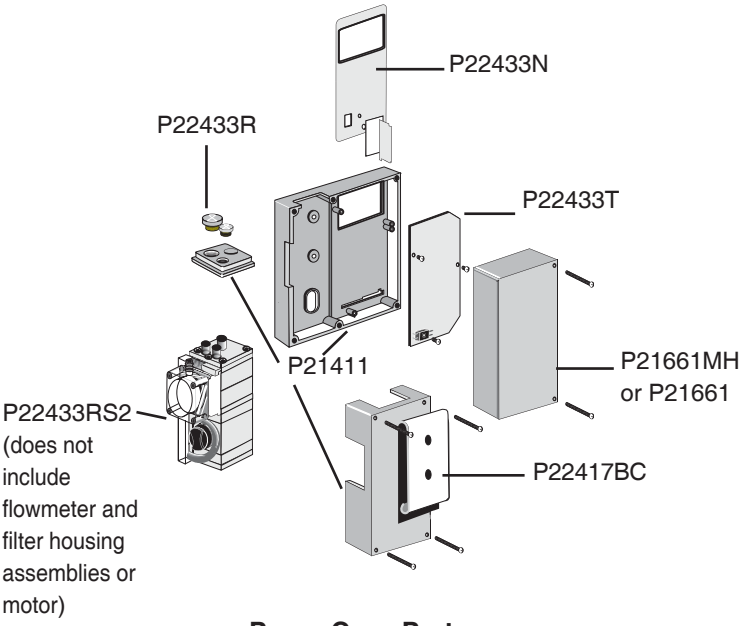
Parts not indicated in illustration

P22417M	Motor/Eccentric Assembly
P22433C	Tamper-resistant Cover
P22433ES	External Screws
P5187	Foam Cover for control board (pk/5)
P72392	LCD

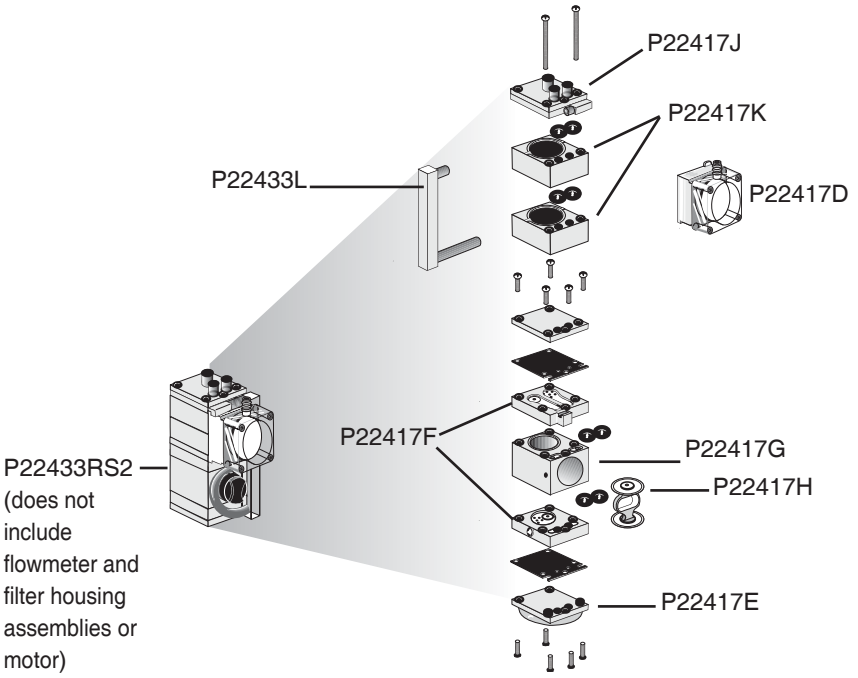
Replacement Filters

P22409	Filter/O-ring (pk/3)
P2240901	Filters (pk/10)
P2240902	Filter/O-ring (100 filters/10 O-rings)

See page 22 for replacement parts listing.



Pump Case Parts



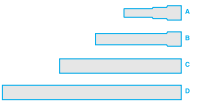
Pump Stack (Part #P22433RS2) Exploded

Optional Accessories

Calibrator:		**Cat. No.**
Defender Primary Standard Calibrator, 50 to 5000 ml/min, includes lead-acid battery, charger (100-240 V), software, and 1-meter serial cable		717-510M

Adjustable Low Flow Holders:	**Cat. No.**
Single Holder	224-26-01
Dual Holder	224-26-02
Tri Holder	224-26-03
Quad Holder	224-26-04

Protective Sample Tube Covers:		**Cat. No.**
Type	*for tubes up to:*	
A	70 mm long (standard charcoal)	224-29A
B	110 mm long (large charcoal)	224-29B
C	150 mm long	224-29C
D	220 mm long	224-29D



Battery Maintenance:		**Cat. No.**
PowerFlex Charging System for SKC Personal Pumps		
5-station, 100-240 V		223-1000
Single, 100-240 V		223-2000
PowerFlex Cables		
Universal XR (5-cell)		223-1002
Universal XR (4-cell, MSHA)		223-1003
Replacement Battery Pack, NiMH		P21661MH
Replacement Battery Pack, NiCad		P21661
Battery Eliminator, for sampling using line voltage *Use voids the UL Listing for intrinsic safety*	115 V	223-325
	230 V	223-325B

Miscellaneous:	**Cat. No.**
Screwdriver Set (included with pump)	224-11
Protective Nylon Pouch with belt and shoulder strap, available in:	
Black	224-87
Red	224-95A

Protective Nylon Pouch

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.
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.

Form #3755 Rev 0207