ANALYT MESSTECHNIK



OPERATING MANUAL

SKC AirChek Essential Sample Pump

Charging, flow rate verification and sampling with the AirChek Essential personal air sampling pump, 1 to 5 L/min and 5 to 500 mL/min with a low flow holder, with maintenance, troubleshooting and ordering information.

AMTC-MN-0037

About this manual

The SKC AirChek Essential is a personal air sampling pump for constant flows from 1 to 5 L/min, and from 5 to 500 mL/min with an adjustable low flow tube holder. It is operated from a three-key touch keypad under a monochrome display that shows the elapsed sampling time. This manual takes you from unpacking to a finished sample: charging the battery, verifying the flow rate with a flowmeter, and sampling. Later chapters cover the parts you may replace yourself, troubleshooting, the technical data and the order numbers of accessories and spare parts.

Read Safety (p. 5) before you use the pump for the first time — the pump's intrinsic-safety ratings, listed under Certifications (p. 23), apply only under the conditions set out there. To start sampling quickly, follow Commissioning (p. 11), Operation (p. 13) and Sampling (p. 17) in that order.

The manual applies to the AirChek Essential pump, Cat. No. 220-3000, and to the kits listed under Checking the contents (p. 7). Kits sold under other catalogue numbers contain the same pump, but their contents can differ from that table; check the packing list. Analyt-MTC supplies, services and supports the pump; for questions, repairs and spare parts see Service, warranty and contacts (p. 25).

Keep this manual for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

Conventions in this manual:

- Keys, buttons and menu entries are printed like this: **PUMP**.

Abbreviations

Abbreviation	Meaning
LED	Light-emitting diode
RH	Relative humidity

How this manual marks information

WARNING

A hazardous situation which, if not avoided, could result in death or serious injury.

Note

Information that helps understanding; never a hazard.

The touch keypad has the keys **PUMP**, **Up** and **Down**. "Touch" means a short tap on a key; "touch and hold" means keeping a fingertip on the key.

Document information

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CHAPTER 1

Safety

Read this chapter before you use the pump for the first time. The intrinsic-safety rating of the AirChek Essential applies when the pump runs on its original battery pack, with approved components only. The rules in this chapter protect that rating, the people working with the pump, or both.

Intended use

The AirChek Essential is a personal air sampling pump: it draws air through a sample medium, such as a filter cassette or a sorbent tube, at a constant flow of 1 to 5 L/min, or of 5 to 500 mL/min with an adjustable low flow tube holder. Use it as this manual describes, only with battery pack P75718 or P75718A and with the approved charging cradles, spare parts and accessories (see Approved parts and accessories (p. 6)).

Charging the pump or running it from a charging cradle in a hazardous location, using a non-approved battery pack, charging cradle or part, and opening the pumping compartment are misuse: they can make the pump unsafe, as the sections below explain.

Hazardous locations

The pump, Cat. No. 220-3000, is rated intrinsically safe (Ex ia) for hazardous locations when it runs on battery pack P75718 or P75718A. The ratings are listed under Certifications (p. 23). The charging cradles are not part of that certification.

⚠ WARNING

Charging the pump, running it from a charging cradle, or removing and replacing its battery pack in a hazardous location can ignite an explosive atmosphere. So can a non-approved part or a charging input above 12 V, because either can impair intrinsic safety. This can cause an explosion. Never charge the pump, or run it from a charging cradle, in a hazardous location. Remove and replace the battery pack only in an area known to be non-hazardous. Replace components only with approved parts. Charge only in an approved charging cradle (see Approved parts and accessories (p. 6)). The charging input must never exceed 12 V (maximum charge input voltage U_m = 12 V, an intrinsic-safety parameter).

Battery pack

The pump runs on a rechargeable lithium-ion (Li-Ion) battery pack, Cat. No. P75718 or P75718A (replacement packs are supplied as P75718A). Treat it like any Li-Ion battery: it stores enough energy to start a fire if it is damaged or overheated. The packs were evaluated for a charging voltage of at most 8.4 V DC and a charging current of at most 1 A; these limits must not be exceeded.

⚠ WARNING

A damaged or overheated battery pack can catch fire or explode, and so can any battery other than P75718 or P75718A. A fire or explosion can cause burns. Do not disassemble the battery pack, heat it above 212 °F (100 °C) or put it in a fire. Replace the battery pack only with battery pack P75718 or P75718A. Keep battery packs out of the reach of children, and in their original packaging until you use them. Dispose of used battery packs promptly, following local and national recycling or waste regulations.

Note
Switch the pump off, and disconnect any tubing and sample media, before you remove the battery pack.

Approved parts and accessories

Power the pump only from battery pack P75718 or P75718A, and charge it only in an approved charging cradle: the Lite Charging Cradle (Cat. No. 220-850), the Standard Charging Cradle (Cat. No. 220-800) or the charging cradle Cat. No. 220-900. Use only the approved spare parts and accessories listed in Ordering information (p. 24): the UL listing for intrinsic safety holds only with approved parts.

WARNING

Powering the pump from any device — a charging cradle included — or from any battery pack other than P75718 or P75718A voids the intrinsic-safety certifications and the warranty. In a hazardous location, the pump can then ignite an explosive atmosphere. In a hazardous location, run the pump only on battery pack P75718 or P75718A. Run the pump from a powered cradle only outside hazardous locations.

Note
Parts that are not approved void the warranty. A repaired or rebuilt battery pack also voids the warranty. Use only the approved parts listed in Approved parts and accessories.

What you may service yourself

You may replace the external parts of the pump: the inlet filter and inlet housing, the battery pack, the protective screen cover and the belt clip. Maintenance (p. 19) describes each task. Everything else — and in particular anything inside the pumping compartment — is service work that keeps the pump's performance and its intrinsic-safety rating; contact Analyt-MTC to arrange it. Repairs that affect intrinsic safety must be done by the manufacturer's authorised service.

WARNING

Opening the pumping compartment can compromise the intrinsic-safety rating of the pump, and it voids the warranty. In a hazardous location, the pump can then ignite an explosive atmosphere. Do not open the pumping compartment.

Not following the warnings, notes and cautions in this manual may cause injury, and voids the warranty.

CHAPTER 2

Product description

Checking the contents

Check the delivery against the table below, which lists the packages given in the manufacturer's instructions. For the order code of a kit, ask Analyt-MTC. If anything is missing, contact Analyt-MTC (see Service, warranty and contacts (p. 25)). The pump on its own, Cat. No. 220-3000, comes without a charging cradle and power supply; order these separately before you can charge it (see Charging accessories (p. 24)). All power supplies work on 100–240 V mains.

Package	Contents
Pump only, 220-3000	Pump with Li-Ion battery pack and screwdriver set
Starter Kit	Pump as above, Lite Charging Cradle, power supply with cord (100–240 V), 3 ft (0.9 m) of Tygon tubing, and collar clip cable with tie
Single High Flow Kit	Pump as above, Lite Charging Cradle, power supply with cord (100–240 V) and filter cassette holder, in a soft-sided nylon carry case
Single High/Low Flow Kit	Pump as above, Lite Charging Cradle, power supply with cord (100–240 V), filter cassette holder, All-in-One adjustable tube holder and Type A protective tube cover, in a soft-sided nylon carry case
3-pack High/Low Flow Pump Kit	3 pumps as above and 3 each of: Lite Charging Cradles, filter cassette holders, All-in-One adjustable tube holders and Type A protective tube covers; one multi cradle power supply with cord and splitter (100–240 V); in a hard-sided case
5-pack High Flow Pump Kit	5 pumps as above and 5 each of: Lite Charging Cradles and filter cassette holders; one multi cradle power supply with cord and splitter (100–240 V); in a hard-sided case
5-pack High/Low Flow Pump Kit	5 pumps as above and 5 each of: Lite Charging Cradles, filter cassette holders, All-in-One adjustable tube holders and Type A protective tube covers; one multi cradle power supply with cord and splitter (100–240 V); in a hard-sided case

Parts of the pump



Figure 1. Pump parts. Left: front and side view; right: top view.
1 Protective screen cover · **2** On/off button · **3** Belt clip (on the back, not visible) · **4** Charging contacts · **5** Battery pack · **6** Display with three-key touch keypad · **7** Inlet housing with filter · **8** Pump inlet · **9** Status LEDs

Switching on and off

The on/off button is on the side of the pump (2 in Figure 1 (p. 7)). Press and hold it briefly to switch on. The display first shows all its symbols for a moment, then the firmware version for 3 seconds, then the set/verify flow screen — or, if a previous run has not been reset, the sampling screen with that run's elapsed time (see The two screens (p. 8)).

Press and hold the button briefly again to switch off. A pump that is not running switches itself off after 60 seconds without use; it keeps the elapsed time of the last run until you reset the timer.

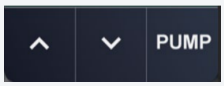
While the pump is sampling, the on/off button has a second function: it locks and unlocks the keypad and dims the display (see Locking the keypad (p. 18)).



Figure 2. Firmware version, displayed for 3 seconds at switch-on.

Using the touch keypad

Lift the protective screen cover and touch the three keys below the display with a fingertip.

	What it does
Up / **Down** (arrows)	Increase or decrease the flow rate on the set/verify flow screen. During sampling, a touch on either arrow briefly shows the relative flow indicator.
PUMP	Touch: starts the pump, or pauses or stops it. Touch and hold: resets the elapsed time and returns to the set/verify flow screen.

The two screens

Set/verify flow screen

On this screen you set the flow rate while the pump is connected to a flowmeter: touch and hold **Up** or **Down** to increase or decrease the flow. The pump does not display the flow rate itself — the actual flow is read on the flowmeter only. What the display shows is the relative flow.

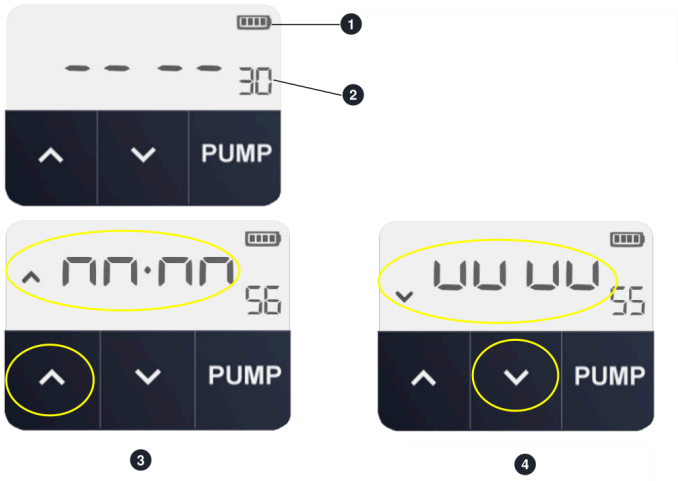


Figure 3. Set/verify flow screen.
1 Battery status (see Battery status (p. 10)) · **2** Relative flow · **3** Flow being increased (**Up** touched) · **4** Flow being decreased (**Down** touched)

> **Note**
> **Relative flow.** A number from 1 to 99 that follows the flow as you adjust it: 1 is the lowest and 99 the highest flow the pump can be set to. The scale differs from pump to pump; on most pumps, 10 ±5 corresponds to about 1 L/min and 80 ±5 to about 5 L/min. Use it to find the flow range quickly, then set the exact flow on the flowmeter.

Sampling screen

Touch **PUMP** to start sampling, and touch it again to pause or stop. The sampling screen shows the elapsed run time and any active lock or fault.



Figure 4. Sampling screen. Touch **PUMP** to begin sampling; touch it again to pause or stop.

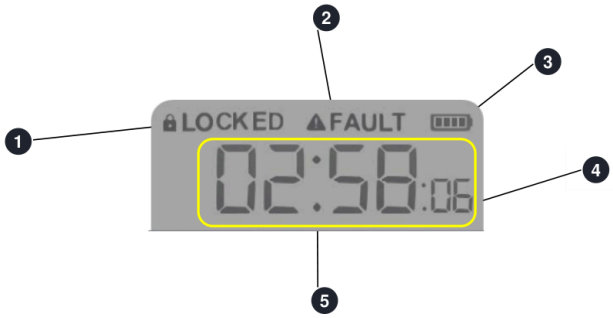


Figure 5. Sampling screen indicators.
1 Keypad locked (LOCKED) · **2** Flow fault or low-battery fault (FAULT) · **3** Battery status · **4** Seconds; replaced by the relative flow while you touch **Up** or **Down**, unless the keypad is locked · **5** Elapsed run time, hours:minutes

Battery status

The battery symbol at the top right of the display has four bars that disappear as the battery discharges.

Bars	Charge remaining
4	Full: approx. 75–100 %
3	approx. 50–75 %
2	approx. 25–50 %
1	approx. 5–25 %
none	A low-battery fault is imminent: the pump will stop and switch off. When it is switched on again, it shows the elapsed run time and the fault symbol until you reset it.

Status LEDs

Two LEDs on either side of the display (9 in Figure 1 (p. 7)) show the pump's state without reading the display.

LEDs	Meaning
Green, flashing	The pump is running.
Red, flashing	Flow fault.
Red and green, flashing	The flow is out of tolerance: the pump is about to enter flow-fault mode, or is attempting an automatic restart after a flow fault (see Faults during sampling (p. 18)).

CHAPTER 3

Commissioning

Charge every battery pack completely before you use the pump for the first time, and again before each flow rate verification and sample. A full charge takes about 3 hours, depending on the battery's capacity and how far it was discharged. The pump can also run while it stands in a powered cradle; run time is then unlimited.

⚠ WARNING

Charging the pump, or running it from a charging cradle, in a hazardous location can ignite an explosive atmosphere. This can cause an explosion. Never charge the pump, or run it from a charging cradle, in a hazardous location. Charge only in the approved cradles listed in Approved parts and accessories (p. 6), powered by the power supplies described below.

Setting up the cradles

Each pump charges in its own cradle. One cradle runs from the Single Cradle Power Supply; up to five Lite Charging Cradles run from one Multi Cradle Power Supply and Splitter. Charge within 0 to 45 °C.

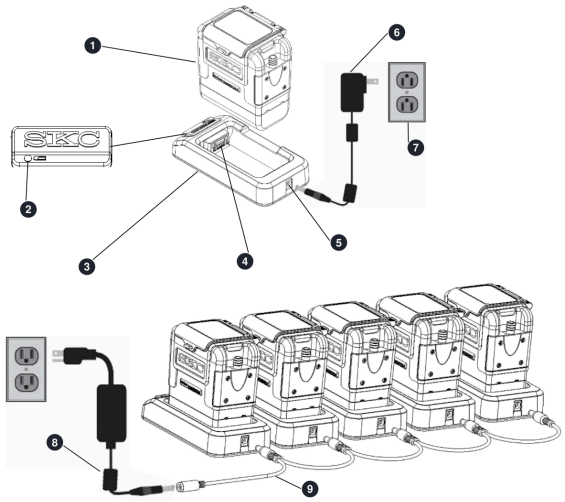


Figure 6. Charging with one cradle (top) and with five cradles (bottom).
1 Pump · **2** Charge status LED (left LED on the cradle) · **3** Charging cradle · **4** Charging contacts · **5** Power port · **6** Single Cradle Power Supply · **7** Mains outlet, 100–240 V · **8** Multi Cradle Power Supply · **9** Power splitter

1. **One cradle:** plug the connector of the Single Cradle Power Supply (Cat. No. 220-600) into the power port of the charging cradle — a Lite Charging Cradle (Cat. No. 220-850) or a Standard Charging Cradle (Cat. No. 220-800). Then plug the power supply into a 100–240 V mains outlet.
2. **Up to five cradles:** connect the Multi Cradle Power Supply to its splitter (both Cat. No. 220-851). Plug one splitter connector into the power port on the back of each Lite Charging Cradle, for up to five cradles. Then plug the power supply into a 100–240 V mains outlet.
3. Align the contacts on the bottom edge of the pump with the contacts in the cradle and set the pump in. Repeat for each pump.
4. Leave the pumps in the cradles until the charge status LED is steady green (about 3 hours).

Reading the charge status

The left LED on the cradle shows the charge status. Watch it for more than 5 seconds before you read it, since one state is a repeating pattern.

Left cradle LED	Charge status
Red, steady	Charging
Red 3 s, green 1 s, repeating	About 75 % charged
Green, steady	Fully charged; trickle charge

CHAPTER 4

Operation

Operation is the same for every sample: set and verify the flow rate with a flowmeter before and after the sample, start and stop the sample with the **PUMP** key, and note its run time.

The sample volume is flow rate times time, so the result is only as good as the flow rate. The AirChek Essential does not display its flow: you set it with a flowmeter in line, with a representative sample medium — the same type of tube, filter or sampler you will sample with — because the medium's resistance changes the flow the pump delivers.

Before you verify

- Charge the battery completely (see Commissioning (p. 11)).
- If the pump has come from a much colder or warmer place, let it adjust to the room temperature first.
- For the best results, let the pump run (**PUMP**) for 5 to 15 minutes before you verify the flow.
- Verify the flow through the complete sampling train, before and after each sample.
- Choose the method for your flow range:

Flow range	Method	You need
1–5 L/min	Verifying 1 to 5 L/min (p. 14)	A flowmeter, e.g. a Medium Flow chek-mate Flowmeter (see Sampling and flow accessories (p. 24))
5–500 mL/min	Verifying 5 to 500 mL/min (p. 14)	A flowmeter; All-in-One adjustable tube holder (one tube), or Dual, Tri or Quad Adjustable Low Flow Tube Holder with Constant Pressure Controller (CPC) (several tubes)

Verifying 1 to 5 L/min

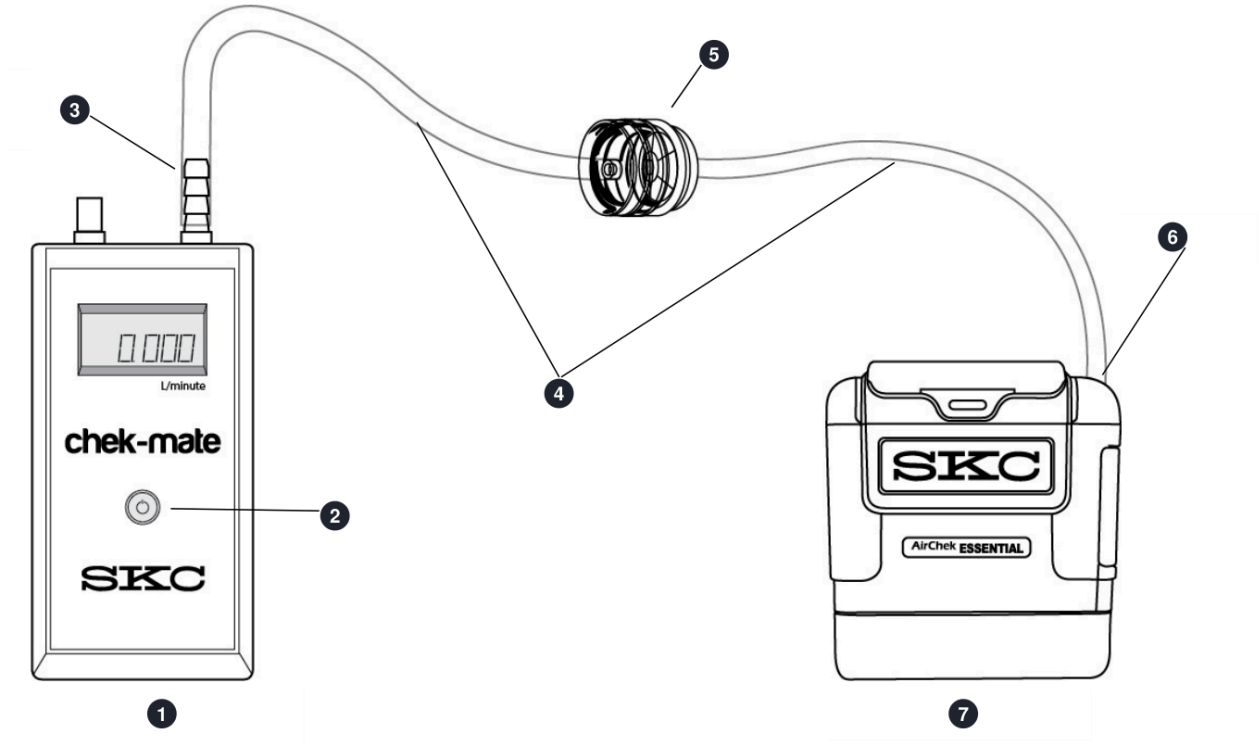


Figure 7. Flow rate verification train for 1 to 5 L/min.
1 Flowmeter (chek-mate shown) · **2** Flowmeter on/off button · **3** Suction port · **4** Tubing · **5** Representative sample medium · **6** Pump inlet · **7** Pump

1. Switch the pump on. If it shows the elapsed time of the last sample, touch and hold **PUMP** to return to the set/verify flow screen.
2. Prepare the flowmeter as described in its instructions.
3. Set up the verification train as in Figure 7.
4. With **Up** and **Down** on the set/verify flow screen, adjust the flow until the flowmeter shows the flow rate your method specifies.
5. Touch **PUMP** to stop the pump. The pump keeps the flow rate you have set.
6. Disconnect the pump from the representative sample medium and the flowmeter, and continue with Sampling (p. 17).

Verifying 5 to 500 mL/min

For flows from 5 to 500 mL/min the pump runs at a higher flow, and an adjustable tube holder sets the flow through each sorbent tube: you adjust it with the brass screw beneath the tube's port. The adjustment changes the reading on the flowmeter, not on the pump.

- **One tube:** All-in-One adjustable tube holder (included in Low Flow Kit 210-500).
- **Several tubes:** Dual, Tri or Quad Adjustable Low Flow Tube Holder with a Constant Pressure Controller (CPC). For details of these holders and the CPC, see their own operating instructions.

Verify the flow through the sampling train before *and* after each sample, with the same tube holder and pump you sample with.

Preparing the tubes and the pump

1. Decide how many tubes, and of which type, you need for verification and sampling. Break the tips off the representative tube(s) for the pre-sample verification. For multi-tube sampling, label the tubes.
2. Switch the pump on. If necessary, reset the timer: touch and hold **PUMP**.
3. Prepare the flowmeter as described in its instructions, and connect its outlet (suction port) to the pump inlet with flexible tubing.
4. With **Up** and **Down** on the set/verify flow screen, set the pump flow:
   - one tube: **1.5 L/min**;
   - several tubes: the sum of all tube flows plus 15 %.
5. Disconnect the tubing from the pump inlet.

> **Note**
> For multi-tube sampling, do not set more than 500 mL/min through any one tube.

Preparing the tube holder

1. Push an opened representative tube into the rubber sleeve of a port, with the arrow on the tube pointing towards the pump. For several tubes, repeat for each port you will sample with.
2. Several tubes only: seal every unused port with an unopened tube, and label the ports to match the tube labels.
3. With a small flat-blade screwdriver, turn the brass flow adjust screw beneath the (first) active port anticlockwise.
4. Connect the flowmeter to the tube — for several tubes, to the first one — as in Figure 10 or Figure 11.

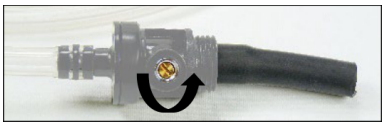


Figure 8. Single tube: tube in the rubber sleeve of the All-in-One adjustable tube holder.



Figure 9. Several tubes: tube in a port of the adjustable low flow tube holder.

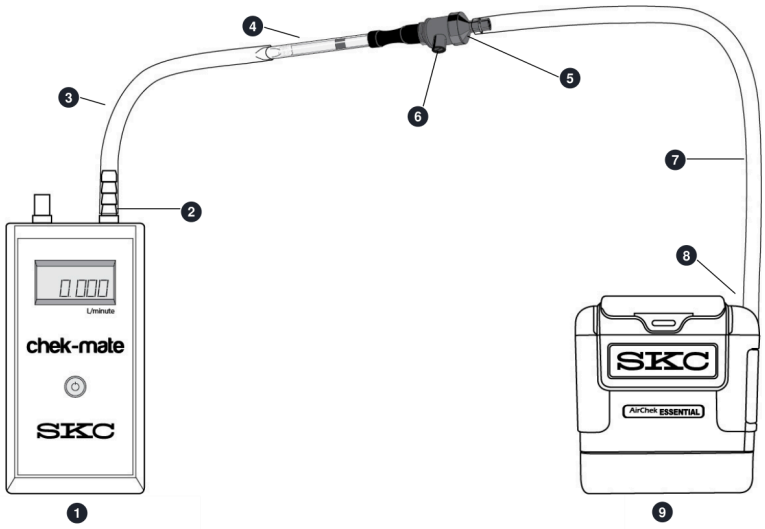


Figure 10. Verification train for one sorbent tube (All-in-One holder).
1 Flowmeter · **2** Suction port · **3** Tubing · **4** Sorbent tube · **5** All-in-One holder · **6** Flow adjust screw · **7** Tubing · **8** Pump inlet · **9** Pump

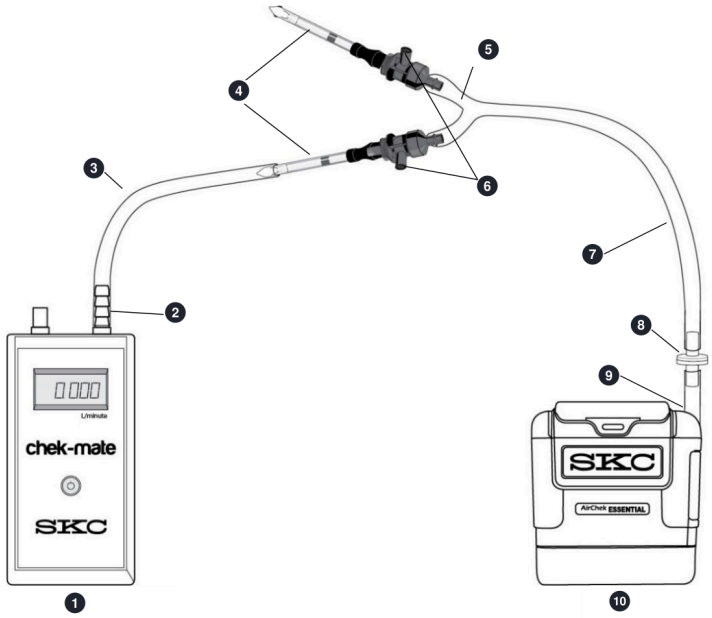


Figure 11. Verification train for several sorbent tubes (dual holder shown).
1 Flowmeter · **2** Suction port · **3** Tubing · **4** Sorbent tubes · **5** Dual adjustable low flow holder · **6** Flow adjust screws · **7** Tubing · **8** Constant Pressure Controller (CPC) · **9** Pump inlet · **10** Pump

Adjusting the flow

1. Turn the flow adjust screw of the port clockwise to reduce the flow, or anticlockwise to increase it, until the flowmeter shows the flow your method specifies.
2. Several tubes: move the flowmeter tubing to the next active tube, turn its flow adjust screw anticlockwise, and repeat step 1. Do this for every active tube.
3. Check the flow through each tube once more before removing the representative tubes. Any correction should be small.
4. Disconnect the pump from the representative tubes and the flowmeter, and continue with Sampling (p. 17).

Sampling

You start and stop each sample with the **PUMP** key; the pump counts the elapsed run time. Note the run time at the end of every sample — together with the verified flow rate, it gives the sample volume.

Before you sample

- Charge the battery completely, and let the pump adjust to the ambient temperature if it has come from a much colder or warmer place.
- Verify the flow with a representative sample medium (see Verifying 1 to 5 L/min (p. 14) or Verifying 5 to 500 mL/min (p. 14)). Verify it through the sampling train before and after each sample.
- The pump can sample while standing in a powered charging cradle — but never in a hazardous location (see Hazardous locations (p. 5)).

⚠ WARNING

Powering the pump from any device — a charging cradle included — or from any battery pack other than P75718 or P75718A voids the intrinsic-safety certifications and the warranty. In a hazardous location, the pump can then ignite an explosive atmosphere. In a hazardous location, run the pump only on battery pack P75718 or P75718A.

Taking a sample

1. After verifying the flow, replace the representative medium with a new, unexposed sample medium.
2. Set up the sampling train as in Figure 12.
3. Touch **PUMP** to start sampling. To protect the sample from an accidental touch, lock the keypad now (see Locking the keypad (p. 18)).
4. To end the sample, touch **PUMP** (unlock the keypad first if it is locked). The elapsed time flashes on the display: note the run time and any other information your method requires.
5. Remove the sample medium and cap it.
6. Fit the representative medium again and verify the flow after sampling (see Verifying 1 to 5 L/min (p. 14) or Verifying 5 to 500 mL/min (p. 14)).

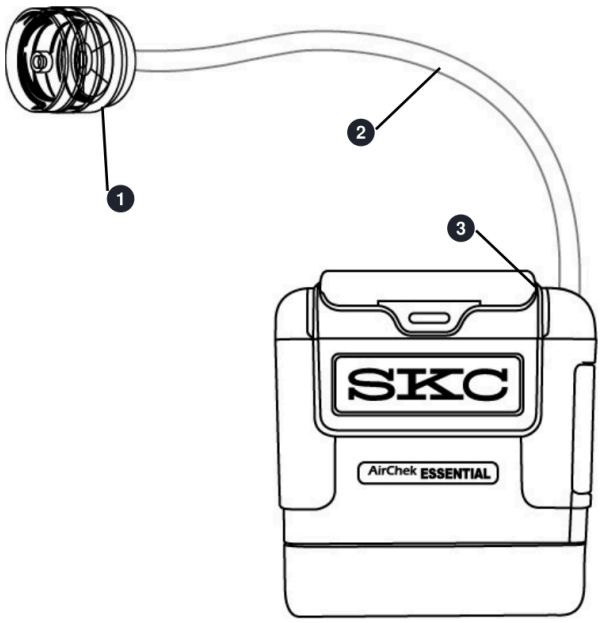


Figure 12. Sampling train (high flow, filter cassette shown).
1 Sample medium · **2** Tubing · **3** Pump inlet

Locking the keypad

The screen lock stops the pump from being paused or stopped by an accidental touch during sampling.



Figure 13. Sampling screen with the keypad locked (LOCKED) and the fault symbol (FAULT).

To…	Do this
Lock the keypad	Press the on/off button while the pump is running. The LOCKED symbol appears and the display dims.
Unlock the keypad	Press the on/off button again. The LOCKED symbol disappears and the backlight returns to full brightness.

Note
While the keypad is unlocked, a touch on **Up** or **Down** during sampling shows the relative flow in place of the seconds (see Sampling screen (p. 9)).

Faults during sampling

The pump keeps the flow constant as the load changes. When it can no longer compensate — because the battery is nearly empty, the sample medium is overloaded or the tubing is kinked — it stops with a fault and shows the FAULT symbol.

Fault	What the pump does	What to do
Low battery	Stops and switches off without warning; how soon depends on the load. The elapsed time of the run is kept. The fault symbol appears when the pump is switched on again and disappears during the next sample.	Charge the battery (see Commissioning (p. 11)).
Flow fault	If a flow fault lasts longer than 15 seconds, the status LEDs flash red, the pump stops running and shows the fault symbol. It then attempts a restart every 15 seconds, up to 5 times. If the flow is corrected during these attempts, the pump continues and the run time keeps accumulating. If not, the pump stops and the run time resets.	Check for kinked tubing and an overloaded or blocked sample medium. Note the run time shown before the restart attempts end.

CHAPTER 5

Maintenance

You may replace four external parts yourself: the battery pack, the screen cover, the belt clip and the inlet filter with its housing. Use only the original spare parts listed in Spare parts (p. 24). All other service is done by Analyt-MTC (see What you may service yourself (p. 6)).

Replacing the battery pack

You need a 2.5 mm hex key (Allen key) and, for a replacement, a new battery pack P75718 (P75718A is also approved).

WARNING

Removing or replacing the battery pack in a hazardous location can ignite an explosive atmosphere. This can cause an explosion. Remove and replace the battery pack only in an area known to be non-hazardous. Read the warnings in Hazardous locations (p. 5) and Battery pack (p. 5) first.

Note

Switch the pump off, and disconnect all tubing and sample media, before you remove the battery pack.

1. Switch the pump off with the on/off button.
2. Loosen the two screws on the bottom of the battery pack housing with the hex key, and pull the battery pack away from the pump case.
3. If you are fitting a new pack, dispose of the old one promptly according to local regulations. Do not take it apart and do not put it in a fire.
4. Align the battery pack with the bottom of the pump case: the connector on top of the pack must meet the protruding contacts of the power control board on the bottom of the case.
5. Push the battery housing onto the pump case until it is seated firmly. The display counts down 20 seconds while the pump sets the zero point of its flow sensor.
6. Tighten the two screws with the hex key, alternating between them.
7. Charge a new battery pack completely before use. A pack you have re-fitted must be at least 25 % charged — two bars on the battery symbol when the pump starts (see Commissioning (p. 11)).

Replacing the screen cover

1. Remove the two screws from the top of the screen cover's mounting block, and lift off the cover with the block.
2. Press the mounting block onto the posts of the new cover, with the underside of the block facing up and its straight edge facing away from the cover. Swing the block away from the cover until it stops against the cover's inside edge.
3. Line up the cover and block with the holes in the top of the belt clip and pump case.
4. Insert the two screws through the block into the belt clip and tighten them gently until snug.
5. Check that the cover closes properly.

Replacing the belt clip

> **Note**
> Do not remove the two lower hex nuts from the main case, and make sure the hex nut in the top of the case does not fall out while the clip is off.

1. Remove the screen cover: take out the two screws from the top of the mounting block and lift off the cover with the block.
2. Remove the screw from the bottom of the belt clip and pull it out through the opening in the clip.
3. Lift the belt clip away from the pump.
4. Push the new belt clip into place until it fits snugly.
5. Insert the belt-clip screw through the opening in the clip into the pump case. Tighten it only until it engages — not fully yet.
6. Refit the screen cover: line up the two holes of the mounting block with the holes in the top of the belt clip, insert the two screws and tighten them until snug. Check that the cover closes properly.
7. Now tighten the screw under the belt clip until snug.

Replacing the inlet filter or inlet housing

1. Remove the four screws from the inlet housing (7 in Figure 1 (p. 7)) and pull the housing away from the pump.
2. Remove the O-ring and the filter.
3. Place the new or existing filter and the O-ring in the inlet recess. The O-ring must lie completely flat.
4. Line up the new or existing inlet housing with the recess and insert the four screws. Tighten them evenly and stop as soon as the housing lies against the pump.

CHAPTER 6

Troubleshooting

Problems and remedies

Problem	Remedy
The pump does not respond to the keypad, or the display shows unusual characters.	Remove the battery pack and fit it again (see Replacing the battery pack (p. 19); work in a non-hazardous area). If the problem persists, contact Analyt-MTC.
The keypad does not react during a sample, and LOCKED is shown.	The keypad is locked. Press the on/off button to unlock it (see Locking the keypad (p. 18)).
The pump stopped during a sample and shows FAULT.	Low-battery or flow fault — see Faults during sampling (p. 18).
The LEDs flash red, or alternately red and green.	Flow fault, or flow out of tolerance: check for kinked tubing and an overloaded or blocked sample medium (see Status LEDs (p. 10)).
The battery symbol shows no bars.	A low-battery fault is imminent. Charge the battery (see Commissioning (p. 11)).
The pump switches itself off.	A pump that is not running switches off after 60 seconds without use. Switch it on again; the elapsed time of the last run is kept.
At switch-on the pump shows an elapsed time instead of the set/verify flow screen.	The timer of the last run has not been reset. Touch and hold **PUMP**.

If none of these remedies helps, contact Analyt-MTC (see Service, warranty and contacts (p. 25)). Do not open the pump: beyond the parts in Maintenance (p. 19), repairs are done by Analyt-MTC.

CHAPTER 7

Specifications

Flow and performance

Pump type	Type P, for personal sampling of airborne particles according to ISO 13137:2022
Flow range	1000–5000 mL/min, constant flow 5–500 mL/min with an adjustable low flow tube holder
Back pressure (pressure drop)	5000 mL/min at 0–5 kPa (0–20 in. H_2O) 4000 mL/min at 0–7.5 kPa (0–30 in. H_2O) 3000 mL/min at 0–10 kPa (0–40 in. H_2O) 2000 mL/min at 0–12.5 kPa (0–50 in. H_2O) 1000 mL/min at 0–15 kPa (0–60 in. H_2O)
Flow control	Isothermal; corrects for changes in back pressure, temperature and atmospheric pressure
Flow fault	After 3 to 10 s of restricted flow the pump stops running, the elapsed time stops, the status LEDs flash red and the pump displays the fault symbol. After 20 s in fault, an automatic restart is attempted, up to 5 times, unless full airflow is restored before. If full airflow is not restored during the 5 restart attempts within 5 minutes, the pump ends the run (see Faults during sampling (p. 18))
Accuracy	Flow control ±5 % of set point · atmospheric pressure ±0.3 inHg · temperature ±1 °C · time ±0.002 %
Sound level	51.7 dB average at 3 ft (1 m), with a 37 mm, 0.8 µm mixed cellulose ester (MCE) filter cassette
Sample media	Sorbent tubes, filters, size-selective particulate samplers, impingers

Power

Battery	Removable, rechargeable Li-Ion battery pack: 7.2 V, 3.3 Ah, 24 Wh (approved packs P75718 and P75718A)
Mains operation	From a powered charging cradle; run time unlimited
Operating time on battery	8 h or more at 2000 mL/min against 4 kPa (16 in. H_2O) back pressure 8 h or more at 5000 mL/min against 5 kPa (20 in. H_2O) back pressure 40 h or more at 2000 mL/min* 15 h or more at 5000 mL/min*
Charging	In a charging cradle: one Lite Charging Cradle 220-850 with Single Cradle Power Supply 220-600, or up to 5 Lite Charging Cradles with Multi Cradle Power Supply and Splitter 220-851; power supplies 100–240 V
Charging time	Approx. 3 hours, depending on battery capacity and state of discharge
Charging limits	Maximum charge input voltage U_m = 12 V (intrinsic-safety parameter) · battery pack charging voltage max. 8.4 V DC, charging current max. 1 A

* Measured with a new pump and battery and a 37 mm, 0.8 µm MCE filter. Run time in use may differ.

Operating conditions

Temperature	Operating 32–104 °F (0–40 °C) · charging 32–113 °F (0–45 °C) · storage −4 to 113 °F (−20 to 45 °C)
Humidity	Operating and storage up to 95 % RH, non-condensing
Altitude	Flow corrected for temperature (32–104 °F [0–40 °C]) and ambient pressure up to 15 000 ft (4572 m) above and down to 4500 ft (1372 m) below sea level

Display and operation

Display	Monochrome display: elapsed sampling time, relative flow, battery status, lock and fault symbols
User interface	Capacitive three-key touch keypad with keypad lock
Status LEDs	Dual LEDs: flashing green = running; flashing red = flow fault

Mechanical

Dimensions	4.1 × 3.7 × 2.8 in (10.4 × 9.4 × 7.1 cm)
Weight	19.4 oz
Case	Polycarbonate with rubberised anti-static overmoulding; belt clip
Ingress protection	IP6X, dust-tight enclosure
Tubing	1/4 in. inside diameter

Certifications

Intrinsic safety	Cat. No. 220-3000 operated with battery pack P75718 or P75718A: Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III; T4 Class I, Zone 0, AEx ia IIC T4 Ga · Ex ia IIC T4 Ga · −20 °C ≤ Ta ≤ 45 °C Ex II 1G Ex ia IIC T4 Ga
Certificates	IECEx UL 19.0100 · DEMKO 19ATEX 2288 · UL22UKEX2351 · cULus Listed, E62011
Standards and marks	Designed to meet ISO 13137:2022 · CE 0539 · UKCA 0843 · RoHS compliant

The certification applies only under the conditions in Safety (p. 5).

CHAPTER 8

Ordering information

Order from Analyt-MTC with the order codes. For the pump kits, see Checking the contents (p. 7). Use only these original parts: they keep the pump's performance, the UL listing for intrinsic safety holds only with approved parts, and other parts void the warranty.

Charging accessories

Description	Order code
Lite Charging Cradle; needs Single Cradle Power Supply 220-600 or Multi Cradle Power Supply and Splitter 220-851	220-850
Single Cradle Power Supply, for one charging cradle, 100–240 V	220-600
Multi Cradle Power Supply and Splitter for Lite Charging Cradles, for 1 to 5 cradles, 100–240 V	220-851

Sampling and flow accessories

Description	Order code
Low Flow Kit, 5–500 mL/min: All-in-One adjustable tube holder and Type A protective tube cover	210-500
Protective pouch, black nylon, with adjustable waist belt and shoulder strap	224-911
Medium Flow chek-mate Flowmeter with CalChek, 0.50–5 L/min; includes 9 V battery. With a calibration certificate traceable to NIST, UK or ISO standards:	NIST: ask Analyt-MTC UK: 375-0550 ISO: 375-0550S

Spare parts

Description	Order code
Replacement battery pack, Li-Ion (P75718 and P75718A are the only battery packs approved for the pump)	P75718A P75718
Belt clip	P51824
Inlet	P20423
Inlet filter and O-rings, pack of 3	P4001
Screen cover	P20422

Note
A repaired or rebuilt battery pack voids the warranty. Replace a worn pack with a new P75718.

CHAPTER 9

Service, warranty and contacts

Analyt-MTC is your contact for everything concerning the AirChek Essential: technical questions, spare parts and accessories, repairs and warranty claims. Any work beyond the user tasks in Maintenance (p. 19) — including anything inside the pumping compartment — is service work; contact Analyt-MTC. Repairs that affect intrinsic safety must be done by the manufacturer's authorised service.

Contact

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Before you contact Analyt-MTC

Have the following at hand so that Analyt-MTC can help you quickly:

- the model and serial number from the rating label on the pump;
- the firmware version, shown for 3 seconds when the pump is switched on;
- what happened, the display symbols and the LED colours you saw.

Returning a pump

Before you send a pump for repair or under warranty, ask Analyt-MTC how to return it and what to include. The pump contains a lithium-ion battery, so the shipping rules below apply.

Shipping lithium-ion batteries

The pump's Li-Ion battery packs have passed the tests of the UN Manual of Tests and Criteria, Part III, subsection 38.3, and are rated below 100 Wh. Pumps and battery packs are nevertheless subject to the special shipping regulations for lithium batteries (UN 3480 and UN 3481). Ask your carrier before you ship them.

Warranty

Make warranty claims to Analyt-MTC; the warranty terms are those of your Analyt-MTC order. The manufacturer's warranty is void if the warnings, notes and cautions in this manual are not followed, and in particular if:

- the pumping compartment has been opened by the user;
- an unapproved battery, charging device or other component has been used;
- a repaired or rebuilt battery pack has been used.

Disposal

Do not dispose of the pump with household waste. Dispose of it as electrical and electronic equipment under local regulations (WEEE). Remove batteries first where fitted and dispose of them separately.

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Sales, service and calibration

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