SKC BioLite+ Pump and BioSampler

Sonic-flow pump to 62 L/min and glass liquid impinger for sampling bioaerosols



The BioSampler collects airborne micro-organisms, such as fungal spores and bacteria, into a swirling collection liquid. The BioLite+ pump was designed for it: its back pressure gauge shows when sonic flow is reached. The glass sampler is autoclaved and reused, and one pump carries two samplers.

62 L/min	850 mbar	12.5 L/min	About 90 %	Up to 8 h
BioLite+ maximum flow	BioLite+ maximum back pressure	BioSampler flow, approximately	BioSampler collection efficiency at 0.5 µm	Constant efficiency with ViaTrap

Performance (BioLite+ pump)

Maximum flow	62 L/min
Maximum back pressure	850 mbar (suction)
Flow against back pressure	Linear, from 62 L/min at no back pressure to zero at 850 mbar
Back pressure gauge	Shows the vacuum of the sampling train; BioSampler sonic flow at 15 inHg
Flow adjustment	Flow adjuster on the front; clockwise reduces the flow
Samplers per pump	Two mounting points; two BioSamplers at 25 L/min in total
Noise level	61–66 dBA at 1 m, depending on flow rate and back pressure

Performance (BioSampler)

Operating principle	Air passes through three tangential sonic nozzles, 0.630 mm, into a swirling flow of collection liquid Inlet admits only particles that would pass the human nose; little bounce or re-aerosolisation
Flow rate	About 12.5 L/min (4.2 L/min per nozzle); each sampler has its own value A change of ±5 % from the baseline calibration may mean a broken or clogged nozzle: replace the nozzle section Recalibrate after replacing the nozzle section; the new flow rate is the new baseline
Sonic-flow condition	Pressure drop of 0.5 atm (15 inHg) or more across the sampler; gauge reads 15–30 inHg
Collection efficiency	Nearly 100 % over a wide range of particle sizes, falling to about 90 % at 0.5 µm
Collection liquid by sampling time [1]	Under 30 min: sterile distilled water, saline, phosphate-buffered saline (PBS), nutrient broth, peptone water Under 30 min: petroleum jelly/hexane coating Over 30 min: ViaTrap mineral oil or glycerol; efficiency virtually constant over 8 h
Pump	High-volume vacuum pump that reaches sonic flow, with a vacuum gauge or manometer

Operating conditions

BioLite+ pump	0–40 °C, 0–95 % RH Keep the side grilles and rear cooling fan inlet clear while it runs
BioSampler with water-based liquid	Not below 41 °F (5 °C), or the liquid crystallises

Mechanical (BioLite+ pump)

Size (W × H × D)	162 × 209 × 303 mm
Weight	228-9615: 7.42 kg (16.32 lb) 228-9620: 7.25 kg (15.95 lb)
Case	Steel casing with integral carrying handle
Enclosure rating	IP20; not water- or splash-proof, keep water out of the case
Rotor vanes	Graphite, set of four; normal wear releases a little carbon dust at the outlet
Connections	Pump inlet tubing connector on the front; IEC mains inlet, on/off switch and fuse holder at the rear

Mechanical (BioSampler)

Construction	Three-piece glass; the nozzle section and collection vessel are a matched set with an etched identifier
Collection vessel	20 mL or 5 mL Viscous liquid: under 20 mL in the 20 mL vessel, under 4 mL in the 5 mL vessel
Tubing and adapters	3/8 in and 1/4 in ID silicone tubing, 1/4 in ID Tygon tubing, two 3/8 to 1/4 in reducers
Sterilisation	Autoclave or oven, 320–356 °F (160–180 °C), 180–240 min, taken apart Kills bacteria, fungi and DNA
Storage	Taken apart, in a clean, dry area away from temperature extremes
Also needed	Liquid trap, pipette, aluminium foil or Parafilm

Electrical and communication

Mains supply	228-9615: 120 V ~ 60 Hz, maximum input current 3.15 A 228-9620: 230 V ~ 50 Hz, maximum input current 1.25 A
Mains leads	228-9615: 3-pin USA 228-9620: 3-pin UK and 2-pin EU
Inlet fuse	228-9615: 4 A; 228-9620: 2 A
Safety	Use the pump only on the mains supply it is designed for Do not open the casing with the mains connected; electric shock hazard

Compliance

WEEE	Marked with the crossed-out wheelie bin; within EU Directive 2002/96/EC on waste electrical and electronic equipment

Applications and analysis

Applications	Indoor air quality; infection control in hospitals and veterinary clinics; biological research Workplaces such as pulp and paper mills, wastewater plants, composting and storage areas; agricultural dust Infectious disease investigations in public buildings; animal and human exposure investigations
Growth culture	Bacteria and fungi to species level; the liquid transfers easily to an agar plate
Microscopic	Counts total airborne bacteria and fungi; limited identification
Biochemical assay	Measures biological compounds such as endotoxins
Immunoassay	Quantifies airborne allergens
PCR	Polymerase chain reaction (PCR); screens samples for a specific genus or species

Pumps, samplers and kits

Order code	Product	Contents
228-9620	BioLite+ pump, 230 V	0–62 L/min; 3-pin UK and 2-pin EU mains leads
228-9615	BioLite+ pump, 120 V	0–62 L/min; USA mains lead
225-9595	BioSampler, 20 mL	Inlet, nozzle section, collection vessel; no ground-joint cap
225-9595K4	BioSampler, 20 mL, set of 4	Four samplers as 225-9595
225-9593	BioSampler, 5 mL	Inlet, nozzle section, collection vessel; no ground-joint cap
225-9597	BioSampler Mini Kit	BioSampler, 2 vessels, caps, case with rod, 120 mL ViaTrap
228-9620KB	BioLite+ BioSampler Kit, 230 V	Pump, BioSampler, extra vessel, bracket, tubing, adapters, rotameter
228-9615KB	BioLite+ BioSampler Kit, 120 V	As 228-9620KB with the 120 V pump
228-9620KBD	BioLite+ BioSampler Deluxe Kit, 230 V	Pump, BioSampler, 2 vessels, case with rod, ViaTrap, tubing, rotameter
228-9615KBD	BioLite+ BioSampler Deluxe Kit, 120 V	As 228-9620KBD with the 120 V pump
P228920, P228921	Inlet fuse, 2 A or 4 A	2 A for the 228-9620, 4 A for the 228-9615
P228922	Pump rotor vanes	Set of four

Order from Analyt-MTC with the order codes.

Accessories

Collection vessel with ground-joint cap, for transport, 20 mL	225-9596
Collection vessel with ground-joint cap, for transport, 5 mL	225-9596A
ViaTrap collection medium, mineral oil for bioaerosol sampling, 120 mL	225-9598A
ViaTrap collection medium, 500 mL	225-9598
ViaTrap collection medium, 950 mL	225-9599
BioSampler case with mounting rod	225-9606
Mounting bracket, holds a BioSampler on the BioLite+ pump	228-9611
Glass trap, keeps collection liquid out of the pump	225-22
Trap sorbent, 200 g, silica gel/activated charcoal mix to remove vapours	225-22-02
Rotameter, 2–20 L/min, 1/4 in ID Tygon tubing on the outlet	320-4A20L

Notes

1. No water-based liquids for more than 30 min or for hydrophobic particles such as fungal spores. Glycerol is not recommended for viable micro-organisms. Sterilise ViaTrap before use; it may not suit PCR analysis.

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