



Operating Instructions

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BioStage® Impactors

The SKC BioStage single-stage viable cascade impactors operate on the principle of inertial impaction and meet NIOSH Method 0800 and 0801 requirements and ACGIH recommendations for sampling viable microorganisms including bacteria and fungi. Made of precision-tooled autoclavable aluminum, sampler components are precision-threaded together for a positive seal. Air is drawn through the impactor where particles are impacted onto an agar collection medium. Two models of the BioStage Impactor are available.

Standard BioStage contains a 400-hole jet classification stage and is operated at 28.3 L/min

BioStage 200 contains a 200-hole jet classification stage and is operated at 14.15 L/min

Specifications

Flow Rate:	Standard BioStage:	28.3 L/min
	BioStage 200:	14.15 L/min
Material:	Inlet cone and base plate:	Precision-tooled autoclavable aluminum
	O-rings:	Duro 50, BUNA-N
Jet Classification Stage:	Standard BioStage:	400 holes (0.25-mm hole diameter)
	BioStage 200:	200 holes (0.25-mm hole diameter)
Sample Media:	90 to 100-mm agar plates*	
Analysis:	Colony culture†	

* Consult laboratory for information on appropriate agar choice.

† In situations where spore counts are high, positive-hole correction should be used. See Macher, J., "Positive-hole Correction of Multiple-jet Impactors for Collecting Viable Microorganisms," *American Industrial Hygiene Journal*, 50 (11), 1989, pp. 561-568, available at www.skcinc.com/pdf/Multiple_Jet_Impactors.pdf

Sample Media

Use appropriate agar in a 90 to 100-mm agar plate with the Standard BioStage or the BioStage 200. Plastic or glass agar plates can be used. Verify with your agar supplier that the plates contain the proper volume of agar to achieve the appropriate agar height to maintain impactor cut-points.

Suggested Media

For Bacteria: Tryptic Soy Agar (TSA) or Blood Agar Plates (BAP)

For Fungi: Potato Dextrose Agar (PDA), Malt Extract Agar (MEA), Dichloran Glycerol 18 Agar (DG-18), or Corn Meal Agar (CMA)

For information on laboratories that can provide agar plates and analyze samples, see Laboratories at www.skcinc.com.



Caution: Clean BioStage before first use and between subsequent uses. See *Cleaning and Sterilizing*.



Caution: Sanitize hands and impactor any time contamination from handling is possible. Do not touch holes in jet classification stage.

Assembly

1. Remove the inlet cone by lifting it up and off.



2. Remove the jet classification stage by gently unscrewing it and lifting it up and off.



Note: Visually inspect condition of O-ring in the inlet cone and in the base plate. Ensure O-ring surface is smooth (i.e., without cracks, cuts, or other damage). Ensure O-ring fits properly in channel in the inlet cone and the base plate. O-ring should lay flush with upper lip of channel. Replace if there is apparent damage, stretching, or thinning.



3. Remove the lid from an agar plate and place it on the three raised metal pins in the base plate of the impactor.



Caution: Do not operate without an agar plate in place.



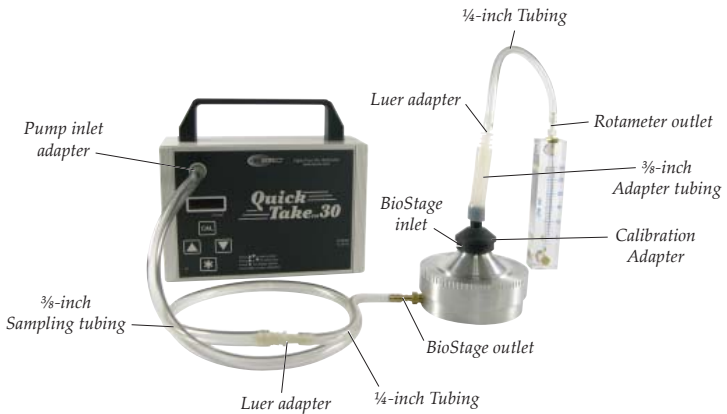
4. Gently screw the jet classification stage back onto the base plate. Align and press the inlet cone onto the jet classification stage until a secure seal is established.



Calibration with a QuickTake Sample Pump



Pump Inlet Adapter



QuickTake® 30 pump and BioStage in calibration train

1. Ensure the BioStage is fully assembled with a representative agar plate in place.
2. Connect rotameter outlet to one end of 1/4-inch ID tubing.
3. Insert small end of a Luer adapter into free end of 1/4-inch tubing.
4. Insert large end of Luer into short length of 3/8-inch adapter tubing.
5. Install free end of adapter tubing onto calibration adapter.
6. Press calibration adapter onto BioStage inlet until firm seal is established.
7. Connect BioStage outlet to one end of 1/4-inch ID tubing.
8. Insert small end of a second Luer adapter into free end of 1/4-inch tubing.
9. Insert large end of second Luer into one end of 3/8-inch sampling tubing and pump inlet adapter into the other end.
10. Insert pump inlet adapter into pump inlet.
11. Calibrate sample pump to 28.3 L/min for Standard BioStage or 14.15 L/min for BioStage 200.

Calibration adapter and rotameter are for use with both models of BioStage. See Accessories.

Sampling



Caution: Sanitize hands and clean the BioStage Impactor in between samples.



Caution: Never use agar that has expired, displays visible cracks, or has been contaminated.



Caution: When sampling indoors, close all doors and windows that could affect airflow in the sampling area.

1. Calibrate the flow rate (see *Assembly*).
2. Remove calibration adapter, tubing, and flowmeter. The BioStage outlet should remain connected to the pump inlet with flexible tubing.
3. Remove the inlet cone and jet classification stage from the BioStage. Place a new, unexposed agar plate into the base plate (see *Assembly*). Remove the lid from the agar plate. Reassemble the impactor.
4. Mount impactor on a tripod, if desired, by screwing the threaded hole on the bottom of the impactor onto the threaded top of the tripod accessory (see *Accessories*).



BioStage mounted on QuickTake 30 Pump with mounting bracket accessory

5. Turn on the vacuum pump and sample for 2 to 5 minutes.



Caution: Sampling too long can cause overgrowth of sample. Sampling times that are too short can cause false negatives.

6. After sampling is complete, turn off the pump and disconnect the flexible tubing.

Removing the Agar Plate (Sample)

1. Remove the inlet cone and jet classification stage (see *Assembly, Steps 1 and 2*).
2. Remove the agar plate containing the sample and **replace its cover immediately**.
3. Label the bottom of the agar plate with all pertinent sampling information. Secure agar plate lid with tape and place in a sealable bag.
4. Place agar plate containing the sample in an ice chest with blue ice.
5. Send the agar plate containing the sample and a blank unexposed agar plate to a laboratory according to laboratory instructions.



Note: Outdoor samples should be collected for comparison to indoor samples. An indoor control sample should be taken also for non-complaint areas. Clearly mark each sample.

Cleaning and Sterilizing

To clean BioStage, disassemble and place parts in an ultrasonic bath with a mild detergent-water solution. Thoroughly rinse and air dry in a dust-free space.

To sterilize BioStage, autoclave or immerse in ethyl alcohol and air dry. In the field, parts can be swabbed with alcohol on a sterile gauze pad and air dried. NIOSH suggests that a representative agar plate be loaded into the BioStage and immediately unloaded to serve as a blank.



***Note:** Visually inspect condition of O-ring in the inlet cone and in the base plate. Ensure O-ring surface is smooth (i.e., without cracks, cuts, or other damage). Ensure O-ring fits properly in the channel in the inlet cone and the base plate. O-ring should lay flush with upper lip of channel. Replace if there is apparent damage, stretching, or thinning.*

Ordering Information

BioStage	Cat. No.
Standard BioStage[‡] single-stage bioaerosol impactor (400 holes, 28.3 L/min)	225-9611
BioStage 200[‡] single-stage bioaerosol impactor (200 holes, 14.15 L/min)	225-9610
BioStage Pump Kit[‡] - AC includes Standard BioStage Sampler, vacuum pump (115 V only) with rotameter, calibration adapter, tubing, tripod stand, and carry case	225-9535K
BioStage Pump Kit[‡] - DC includes Standard BioStage Sampler, QuickTake 30 pump with battery, AC charger/adapter (100-240 V), mounting bracket with inlet adapter, calibration adapter, field rotameter, tubing, and deluxe carry case	228-9530K

Accessories	Cat. No.
Calibration Adapter for BioStage , allows tubing to connect to BioStage inlet. <i>Suitable for both BioStage models</i>	P33100
Tripod Stand , telescopes to 5 feet to hold BioStage in breathing area (does not hold pump)	225-9536
Mounting Bracket for QuickTake 30 , holds BioStage in place on pump during sampling	228-9531
Replacement O-ring for Base Plate , ea	P32287
Replacement O-ring for Inlet Cone , pk/2	P31893

[‡] Requires microbiological media supplied by analytical laboratories. For lab list, go to www.skcinc.com.

SKC Limited Warranty and Return Policy

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References

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