



# *BioCapt® Adjustable Height Microbial Air Sampler Impactor*

OPERATIONS MANUAL

# BioCapt® Adjustable Height Microbial Air Sampler Impactor Operations Manual



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# BioCapt® Adjustable Height Microbial Air Sampler Impactor Operations Manual

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## Quality Statement

The Quality Policy of Particle Measuring Systems is to strive to meet or exceed the needs and expectations of our customers, and to align the activities of all employees with the common focus of customer satisfaction through continuous improvement in the quality of our products and services.

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## Manual Conventions

This manual uses the following conventions to call the reader's attention to certain text.

### WARNING

A warning in the text is used to notify the user of the potential for bodily injury or death.

### CAUTION

A caution in the text is used to highlight an item that if not done, or incorrectly done, could damage the instrument and/or any materials or devices affected by the instrument.

### -- NOTICE --

A notice in the text is an instructional communication regarding requirements or policies issued by Particle Measuring Systems.

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**NOTE:** A note in the text is used to highlight an item that is of operational importance to the user.

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It is important that you observe cautions and warnings while performing the procedures described in this manual. Caution and warning labels are located on and inside the instrument to alert you to potentially hazardous conditions. Please familiarize yourself with this information.

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# Chapter 1

## Introduction

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The BioCapt® Adjustable Height Microbial Impactor is a stainless steel air sampling device that enables dedicated, efficient microbiological monitoring of sterile environments.

The BioCapt is designed as an active microbial air sampling atrium using the principle of impaction. The BioCapt uses a vacuum source to pull sample air through the inlet slits on the top of the atrium. This sample air is made to change direction dramatically at the outlet of the slits, whereby particles of appreciable mass diverge from the airflow streamlines and are impacted onto suitable agar collection media. The agar plates are then incubated and the colony-forming units (CFUs) that grow are later enumerated.

The BioCapt impactor head design is used in portable microbial monitoring applications in conjunction with a sampling device, such as the MiniCapt® Mobile Microbial Sampler, or in dedicated Facility Monitoring System (FMS) applications as a stand-alone microbial sample collection device.

This manual deals only with the BioCapt impactor head when used in a dedicated FMS application. For portable sampler applications, refer to the MiniCapt Mobile Microbial Sampler Operations Manual from Particle Measuring Systems.

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## Chapter 2

# General Characteristics

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### Specifications

Specification	25/50	100
Material	AISI 316L Stainless Steel	
Air Inlet	20 Radial Slits	
Flow Rate	25 LPM	100 LPM
Agar Plate Diameter	86 to 92 mm	
Agar Plate Volume	18 to 32 ml	
Agar Plate Depth	3 to 6 mm	
Vacuum Connection*	1/2-inch Side Barb fitting	3/4-inch Side Barb fitting
	3/4-inch Side Barb fitting	3/4-inch Tri-Clamp fitting
	3/4-inch Tri-Clamp fitting	-

**Table 2-1. BioCapt Adjustable Height Specifications**

**\*NOTE:** Vacuum connection is based on the BioCapt configuration ordered.

### BioCapt Operational Features

During active air sampling for FMS applications, the BioCapt Microbial Air Sampler's airflow control is provided by one of the following:

- FacilityPro® Pneumatic Sensor Module
- MiniCapt Mobile Microbial Air Sampler
- MiniCapt Remote Microbial Air Sampler

The BioCapt Adjustable Height Microbial Air Sampler impactor can operate with a variety of agar plates (see *Table 2-1. BioCapt Adjustable Height Specifications*).



**Figure 2-1. BioCapt Adjustable Height**

## Available Styles of the BioCapt Adjustable Height

There are three styles of BioCapt Adjustable Height Microbial Air Sampler Impactors available. All have an impactor head that twists easily to lock into the base of the impactor. The head must be rotated to be removed from the base of the unit.

### Side Outlet Style

The side outlet impactor style has a side outlet barb fitting or tri-clamp tubing connector. See **Figure 2-2** and **Figure 2-3**.



**Figure 2-2. Side outlet barb fitting**



**Figure 2-3. Tri-clamp tubing connector**

## Mushroom Style

The mushroom impactor style has a bottom tri-clamp tubing connector. See **Figure 2-4**.



**Figure 2-4. Mushroom style**

## Isolator Stand Style

The isolator style uses a fully stainless steel 316L tripod with the same locking head design as the side outlet and muchroom styles. The isolator style is specifically designed for use in isolators and guarantees a high, stable position.



**Figure 2-5. Isolator stand**

## Chapter 3

# Unpacking, Installation and Setup

---

### Unpacking

Upon receipt of goods, ensure all ordered items are accounted for. See **Chapter 5** for a full list of BioCapt Adjustable Height parts and accessories.

Unpack the impactor head(s) using gloves. Fingerprints on freshly manufactured stainless steel may result in long lasting marks on the surface. See **Chapter 6, “Cleaning Procedures”** on page 6-1 for first-time cleaning instructions.

### Installation Considerations

Two main conditions must be addressed when installing the BioCapt Adjustable Height Microbial Air Sampler Impactor for FMS applications:

- Connection of the vacuum source to the atrium
- Mounting of the atrium in a location within a 12-inch (0.03 m) radius of a sampling location

#### CAUTION

Particle Measuring Systems strongly recommends choosing biological monitoring locations based on a formal risk analysis of the contamination hazards to product and process that exist within the manufacturing facility. Examples of such formal risk analysis systems are Failure Mode and Effect Analysis (FMEA) or Hazard Analysis Critical Control Point (HACCP).

The vacuum source can be provided by a variety of devices, such as:

- MiniCapt Mobile Microbial Air Sampler
- MiniCapt Remote Microbial Air Sampler
- FacilityPro Monitoring Systems

The impactor can be integrated in different third party monitoring systems. Contact Particle Measuring Systems for more information.



## Mounting Considerations

The impactor must be mounted correctly to obtain meaningful sampling data.

Ensure the inlet slits are oriented in the direction of airflow. Use brackets, mounting stands and adapters to achieve proper orientation.

Contact your Particle Measuring Systems representative or Project Services department for additional assistance in choosing a mounting configuration that works best for your environment.

An example of a possible mounting configuration is shown in **Figure 3-1**.



**Figure 3-1. Mounting configuration for side outlet barb fitting configuration**

## Adjust the Plate Height in the Plate Holder

To ensure optimal performance of the impactor, adjust the plate holder to fit the agar plate.

### Plate height adjustments

1. Remove the sampler head.



2. Turn the plate holder counterclockwise until it is flush with the top plane of the sampler (this is approximately 2-3 clicks from being loose).  
If the plate is unscrewed completely and becomes loose, tighten clockwise until one or two clicks have been engaged.
3. Turn the plate holder clockwise for the following plate pour volumes:
  - 32 ml pour – turn the plate holder 4 complete turns
  - 25 ml pour – turn the plate holder 3 complete turns
  - 18 ml pour – turn the plate holder 2 ½ turns
4. For fine adjustment:
  - a. Establish the setting from above.
  - b. Place the agar plate on the plate holder. (See **Figure 3-2**)
  - c. Remove the lid from the agar plate.



**Figure 3-2. Agar plate on the plate holder**

5. Check to see if the media contacts the underside of the sampler head.
6. If contact does not occur, raise the plate holder 1 click incrementally until contact is made (see **Figure 3-3**).



**Figure 3-3. Rotate plate holder counterclockwise to increase its height**

7. Once contact is made, it is essential to lower the plate holder 5 clicks (0.5 mm).
8. Remove the agar plate.
9. Rotate the plate holder clockwise (see **Figure 3-4**).



**Figure 3-4. Rotate plate holder clockwise to decrease its height**

10. Clean the impactor head and discard the test agar plate.

This procedure establishes the correct sampler head position for the media type used, ensuring maximum collection efficiency.

## Lock the Plate Holder

After sample plate height adjustment, secure the plate holder position by turning the locking pin counterclockwise.

Use a flat screwdriver or similar tool to ensure a secure lock.



**Figure 3-5. Rotate the locking pin clockwise to lock the position**

## Adjust the Plate Holder Width

If the agar plate does not fit inside the plate holder brackets, you can adjust the brackets on the plate holder to increase or decrease its diameter. This procedure requires:

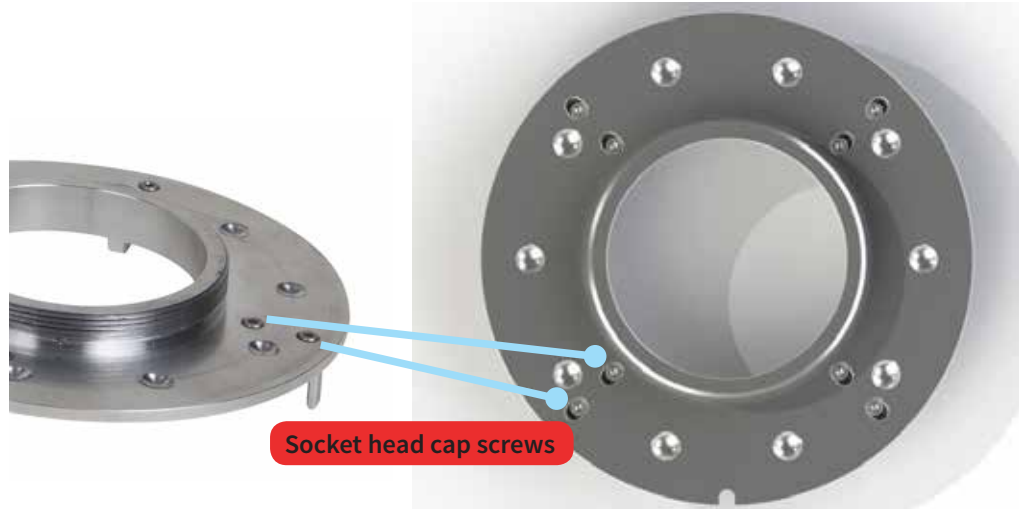
- 1.5 mm hex driver
- Agar plate

1. Remove the sampler head.
2. Remove the plate holder (see **Figure 3-6**) by rotating it counterclockwise.



**Figure 3-6. Rotate the plate holder counterclockwise to remove it**

3. Lay the plate holder on a flat surface, bottom up. Notice the bottom of the plate holder has socket head cap screws that match up with the brackets on the top of the plate holder (see **Figure 3-7**).



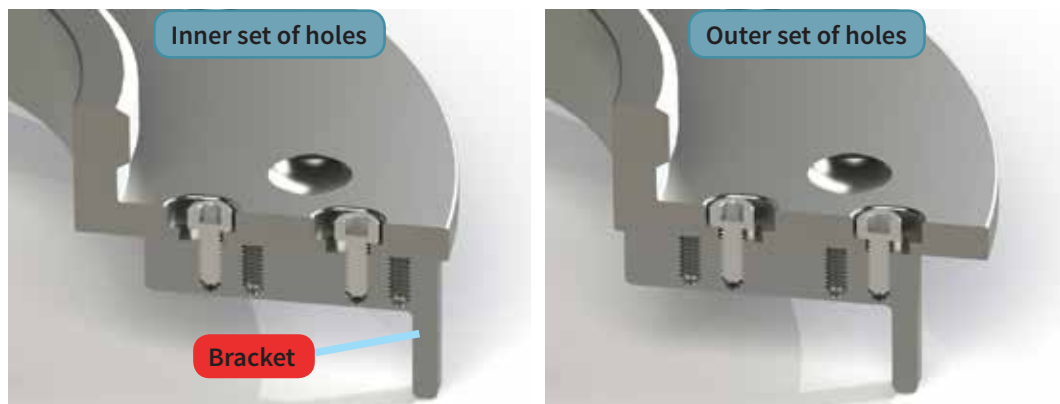
**Figure 3-7. Bottom of plate holder**

4. Depending on the size of your Petri plate, you will need to use a 1.5 mm hex driver to either:
  - Loosen the screws to allow each bracket limited movement across the plate holder, OR
  - Completely remove the screws to line up the brackets over the other set of holes

---

**NOTE:** The **outer** set of holes fits 86 - 89 mm diameter Petri plates.  
The **inner** set of holes fits 89 - 92 mm diameter Petri plates.

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**Figure 3-8. Cross-section of one plate holder bracket**

5. Flip the plate holder upright. Place the dish inside the brackets, centered with respect to the circles etched into the plate holder (see **Figure 3-9**).



**Figure 3-9. Petri dish placed on plate holder brackets**

6. Adjust the brackets to hold the dish in the new, centered location.
7. Remove the dish and flip the plate holder.
8. Use the 1.5 mm hex driver to tighten all 8 socket head cap screws into each bracket's new position.
9. Reinstall the plate holder by turning clockwise.
10. Reinstall the sampler head.

## Chapter 4

# Cleaning and Maintenance

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### Autoclaving the BioCapt Adjustable Height

The BioCapt Adjustable Height can be autoclaved once per day for up to 15 minutes at a maximum temperature of 121 °C.

1. Prior to autoclaving, clean the BioCapt Adjustable Height with isopropyl alcohol (IPA) 70/30 or another suitable chemical agent.

The chemicals listed below are compatible with 316L stainless steel:

- Isopropyl Alcohol (IPA 70/30)
  - Sodium Hypochlorite 1% (NaClO)
  - Hydrogen Peroxide, up to 6% (H<sub>2</sub>O<sub>2</sub>)
2. To avoid discoloration, remove any cleaner residue and ensure all surfaces are dry prior to autoclaving.

### Cleaning the BioCapt Adjustable Height between Autoclave Cycles

1. The BioCapt Adjustable Height should be cleaned with IPA 70/30 or another suitable cleaner (e.g H<sub>2</sub>O<sub>2</sub>, up to 6%) prior to use at each sampling location and after any known contamination event (IPA is preferred).
2. All cleaner residues should be allowed to evaporate until dry prior to sampling.






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## Chapter 5

# Accessories and Consumable Parts


*All images used are for illustrative purposes only and are not to scale.*

Part Description	Part Number	Picture
Barb-fitting side outlet 25/50 LPM	790018-0000	
3/4-inch Barb-fitting side outlet 100 LPM	790018-0105	
3/4-inch Tri-clamp side outlet 25/50 LPM	790018-0010	
3/4-inch Tri-clamp side outlet 100 LPM	790018-0110	
3/4-inch Tr-clamp mushroom bottom outlet 25/50 LPM	790018-0020	
3/4-inch Tri-clamp mushroom bottom outlet 100 LPM	790018-0120	

**Table 5-1. Accessories and Consumable Parts list**

Part Description	Part Number	Picture
Spare Impactor Head 25/50 LPM	1000019036	
Spare Impactor Head 100 LPM	1000019035	
3/4-inch Tri-clamp Gasket	90790059	
Orange impactor head o-ring	1000021241	
3/4-inch Triclamp to 1/2-inch barb-fitting for 100 LPM tubing	90790056	
3/4-inch Tri-clamp to 3/4 inch barb fitting For 25/50 LPM tubing	90790057	
3/4-inch Tri-clamp	90790059	
Remote Sampling Adaptor For connection with Minicapt Air Sampler	90790058	

**Table 5-1. Accessories and Consumable Parts list**

Part Description	Part Number	Picture
1/2-inch Polyurethane Transparent Tubing for 25/50 LPM	1000009341	
3/4-inch Polyurethane Transparent Tubing for 100 LPM	1000012960	
1/2-inch Silicon Tubing Platinum Cured for 25/50 LPM	1000021253	
3/4-inch Silicon Tubing Platinum Cured for 100 LPM	1000021254	
<b>Table 5-1. Accessories and Consumable Parts list</b>		

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## Chapter 6

# Cleaning Procedures

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### Introduction

This chapter describes the recommended cleaning practices for BioCapt® and MiniCapt® impactor heads and accessories.

All delivered products and materials from Particle Measuring Systems are tested and cleaned according to the most demanding cleanroom requirements. Despite this, the presence of manufacturing and/or handling residues may occur for 316L stainless steel items such as BioCapt or MiniCapt impactor heads which undergo a highly complex machining process.

The presence of residues on 316L stainless steel products while autoclaving may result in discoloration of the item. Leftover residues may change in color as a result of the sterilization's high temperature.

### Cleaning Guidelines for Goods upon Reception

For first time usage:

1. Unpack the impactor head(s) using gloves. (Note: Fingerprints on freshly manufactured stainless steel may result in long lasting marks on the surface.)
2. Wash the whole stainless steel surface, including mechanical parts, using an appropriate detergent solution.
  - For example, Veltek Vai's Process2Clean 1 (P2C-1) appropriately diluted (typically 1-5 Vol% in DI or WFI water).
3. Rinse each item extensively with DI or WFI water in order to completely remove any detergent residuals.
4. Ensure the impactor head is well cleaned, rinsed and dried before proceeding with the first autoclave sterilization process.

## Runtime Cleaning Guidelines

1. Remove the impactor head from the sampling location.
2. Ensure no residuals (e.g. from agar) are present on the impactor head.
3. Wash the entire stainless steel surface, including mechanical parts, using an appropriate detergent solution.
  - For example, Veltek Vai's Dec-Clean, appropriately diluted, typically 0.7 (Vol %) (1 fl oz/gallon) in WFI water.
4. Ensure the impactor head is well cleaned, and any cleaning agent residues have evaporated before proceeding with the autoclave sterilization process.

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**NOTE:** The above procedures are intended to provide general guidelines, and may be not applicable in some specific manufacturing scenarios.

For more information, contact your Particle Measuring Systems local representative or go to [www.pmeasuring.com](http://www.pmeasuring.com).

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## Appendix A

### 有毒或有害的物质和元素

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Part Name 部件名称	有毒或有害的物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
机械部件	X	O	X	X	X	X
<p>O: 表示用于部件的所有同族物质中所含的有毒或有害物质低于SJ/T11363-2006规定的限度要求。</p> <p>X: 表示用于部件的至少一种同族物质中所含的有毒或有害物质高于SJ/T11363-2006规定的限度要求。</p>						



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