

## Operating Instructions

# *Bio-Pump<sup>®</sup> Plus*

Product # ZBP-200



### Description

The Bio-Pump<sup>®</sup> Plus is an advanced portable, battery powered air sampling pump designed for the exclusive use with *Air-O-Cell<sup>®</sup>*, *Via-Cell<sup>®</sup>*, and *Air-O-Cell<sup>®</sup> CSI* cassettes.

### Specifications

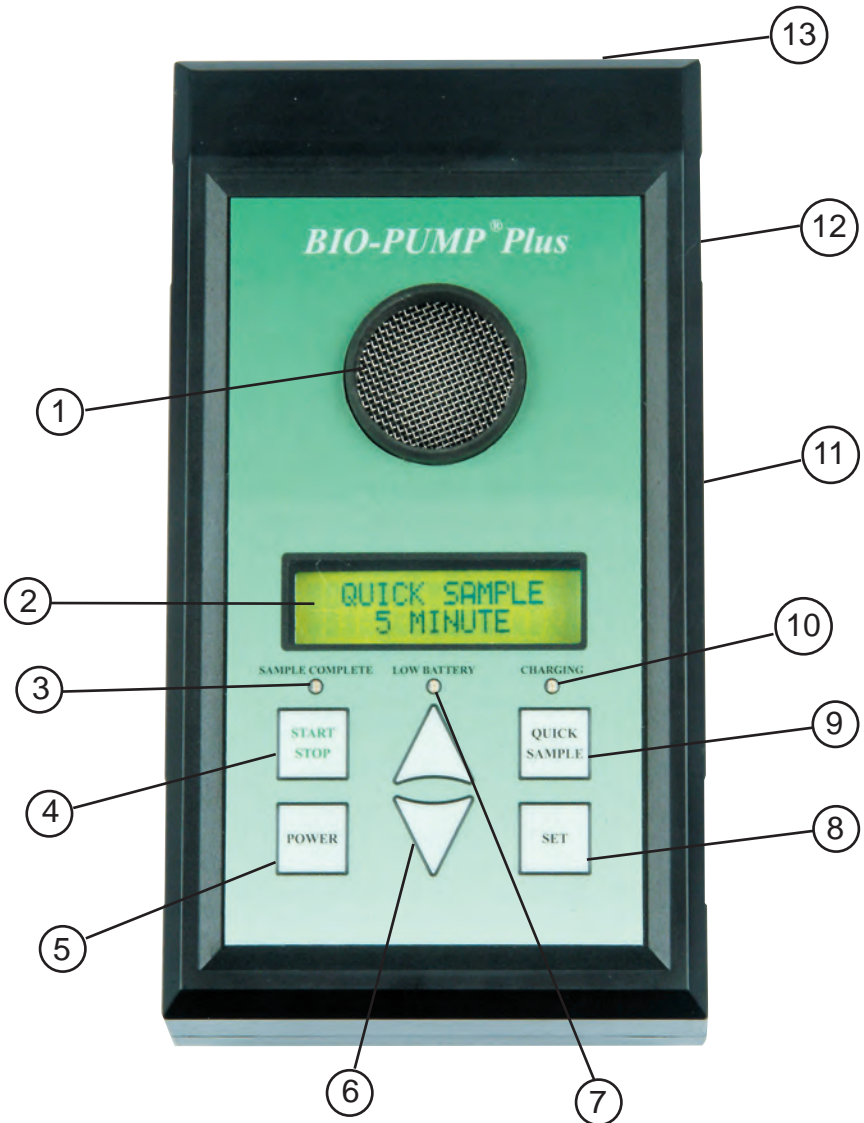
<b>Flow Rate:</b>	15LPM
<b>Accuracy:</b>	± 5 %
<b>Housing:</b>	ABS Plastic
<b>Battery:</b>	Rechargeable Nickel Metal Hydride (NiMH)
<b>Run Time:</b>	Minimum 8 hours continuous (100 Five minute samples new, fully charged battery)
<b>Dimensions:</b>	4.3/8" (w) x 2.75" (h) x 8" (d) inches
<b>Weight:</b>	1.6lbs



Sampling Equipment Specialists

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# Pump Overview



1. Rubber Grommet Cassette Attachment
2. LCD Display
3. "Sample Complete" Light
4. START/STOP Button
5. POWER Button
6. UP/DOWN Arrows
7. "Low Battery" Light
8. SET Button
9. QUICK SAMPLE Button
10. "Charging" Indicator Light
11. Tripod Mounting Threads, 1/4" (on bottom)
12. Battery Compartment (on bottom)
13. Battery Charging Jack

# Calibration

It is recommended that the Bio-Pump® Plus be calibrated and verified at least once every day of use. A flow indicator for *Air-O-Cell*® cassettes and *Via-Cell*®/*Air-O-Cell*® CSI cassettes is supplied with the pump for ease of calibration. You may also calibrate your pump using the optional Bio-Pump® TSI Primary Calibrator. These are the only approved calibrators that are specially designed to work with low backpressure impeller fan type pumps.

**A note on ZBP-302 & ZBP-305 Flow Indicators:** Under low humidity conditions, free movement of the float ball can be influenced by static. Prior to use, verify free movement of the float ball by slowly turning the flow meter upside down. If the float ball seems to stick in the channel, blow gently into the bottom of the flow meter for 2-3 seconds, then re-check for free movement.

## Warning

Do NOT calibrate the pump using any other devices. Doing so will yield inaccurate readings due to the backpressure created by the calibrators. Calibrators known by *Zefon* to cause these inaccuracies include, but are not limited to:

Bios Drycal, Bios Defender, Gilian Gilibrator, Gilian Challenger, or standard miniBUCK calibrators.



Connect flow indicator to pump as shown



Adjust flow until ball is centered on line.

## Adjusting the Calibration

1. Press the POWER button to turn the pump on.
2. Using the arrows, select CALIBRATE BIO-PUMP.
3. Connect the flow indicator or bubble tube.
4. Press the SET button and the unit will start running at a low speed.
5. Use the arrows to adjust the flow rate until 15LPM is shown on the flow indicator or bubble tube. Note: When setting calibration, the flow starts out very low. Continue to press the up arrow until 15LPM is reached. This may take as many as 15 pushes of the button.
6. Press the set key to save the calibration. The pump will stop automatically.

Calibrate  
Bio-Pump

Adjust Flow  
Then Press Set

*Note: To check the pump calibration you must use the "verify calibration" setting. Using the Calibrate Bio-Pump® mode will erase the previous flow setting from memory and revert to a low speed setting.*

## Verifying the Calibration

1. Press the POWER button to turn the pump on.
2. Use the arrow buttons to select VERIFY CALIBRATION.
3. Connect the flow indicator or bubble tube.
4. Press the SET or START button to begin.
5. Measure the flow rate with the calibrator. To stop, press the stop button. To adjust the calibration, use the CALIBRATE BIO-PUMP option as described above.

Verify  
Calibration

# Sampling Modes

Bio-Pump® Plus comes with 3 different sampling modes to choose from:

## 1. Quick Sample Mode

Quick Sample modes allows easy sampling of the most commonly used predetermined sampling times of 1, 2, 5 or 10 minutes.

## 2. Single Sampling Mode

Single Sampling Mode is designed to take one sample at a predetermined amount of time. The amount of sample time can be set anywhere from 1 minute to 9 hours 59 minutes.

## 3. Sequential Sampling Mode

Sequential sampling allows the pump to be programmed to turn on and off at predetermined times.

Example: it can be programmed to run for one minute every hour for five hours.

## Taking Sampling Using the Quick Sample Mode

1. Place the pump in the desired location.
2. Place cassette on the rubber grommet on top of the pump so that the cassette fits snugly.
3. Press the POWER button to turn the pump on.
4. Press the "QUICK SAMPLE" button. The display should read "Quick Sample", 1 minute.
5. Continue to press the "QUICK SAMPLE" button to change the sampling time from 1, 2, 5 and 10 minutes.
6. Once the correct number of minutes is displayed, press "START" to begin sampling.
7. Once completed, the unit will beep, the display will show "SAMPLE COMPLETE" and the yellow sample complete light will turn on. Remove cassette from pump by gently pulling upward. Seal cassette, document the sample run time and send to laboratory for analysis.

QUICK SAMPLE  
1 MINUTE

Select Quick Sample Time, then  
press START

RUN TIME 00:00  
SET TIME 00:00

Display shows set time and run time  
during sampling

SAMPLE COMPLETE

## Taking Samples Using Single Sampling Mode

1. Place the pump in the desired location.
2. Place cassette on the rubber grommet on top of the pump so that the cassette fits snugly.
3. Press the POWER button to turn the pump on.
4. Using the arrows, select "SINGLE SAMPLING MODE"
5. Press SET.
6. Using the arrows, enter the sample run time (adjustable in 1 minute increments)
7. Press SET.
8. Press START to begin sampling. Once completed, the unit will beep, the display will show "SAMPLE COMPLETE" and the red sample complete light will turn on. Remove cassette from pump by gently pulling upward.
9. Seal cassette, document the sample run time and send to laboratory for analysis.

SINGLE  
SAMPLING MODE

Use Up/Down arrows to select Single  
Sampling Mode, then press SET

ENTER RUN TIME  
0:00:00

Use Up/Down arrows to enter the  
desired run time, then press SET

PRESS START  
TO RUN SAMPLE

RUN TIME 00:00  
SET TIME 00:00

Display shows set time and run time  
during sampling

SAMPLE COMPLETE

# Taking Samples Using Sequential Sampling Mode

1. Setup the pump as described in steps 1-3 for single sampling mode.
2. Using the arrows, select "SEQUENTIAL SAMPLING MODE", then press SET.
3. Using the arrows, select the number of on/off cycles, then press SET.
4. Using the arrows, select the CYCLE RUN TIME (adjustable in seconds), then press SET.
5. Using the arrows, select the CYCLE OFF TIME (adjustable in seconds), then press SET.
6. Press START to begin sampling. Once completed, the unit will beep, the display will show "SAMPLE COMPLETE" and the yellow sample complete light will turn on. Remove cassette from pump by gently pulling upward.
7. Seal cassette, document the sample run time and send to laboratory for analysis.

SEQUENTIAL  
SAMPLING MODE

# ON/OFF CYCLES  
01

CYCLE RUN TIME  
00:00

CYCLE OFF TIME  
00:00

PRESS START  
TO RUN SAMPLE

## Battery

### Checking the Remaining Amount of Battery Power

1. Press the POWER button to turn the pump on.
2. Using the arrows, select BATTERY LEVEL. The display will show "Checking Battery Level".
3. After a few seconds the percentage of battery life remaining will be displayed.

Battery Level  
100%

*Note: The percentage shown may vary up or down at times as the batteries adjust themselves. Nickel Metal Hydride (NiMH) batteries constantly work at regenerating themselves and releasing more power. It is possible for the displayed battery level to increase or decrease without being used because of this.*

### Low Battery Shut Down

If the battery becomes low enough that the unit will not operate at a constant speed, the unit will shut down. During shutdown the amount of actual run time will be saved. When power is restored, simply turn the power on, press the SET button, and the time the pump ran before shutting down will be displayed.

### Charging the Battery

To charge the battery, plug in the charger. The green charging light next to the LCD display will illuminate to indicate the unit is charging. When charging is complete, the light will go out. A full battery charge takes approximately 3 hours. If the pump will not be used for an extended period of time, it will slowly lose its battery charge and will need to be recharged before use. During these extended periods the pump can be kept plugged in so the battery receives a trickle charge.

*Note: During a trickle charge, the battery charging indicator light will not illuminate.*

### AC Power Operation

The Bio-Pump® may be run using standard AC power supplied by the charger. To do this simply plug in the charger and run as normal.

### Installing a New Battery

1. Remove the two screws from the battery compartment cover on the bottom of the pump.
2. Pull out the battery and unplug the cord.
3. Plug in the new battery and insert into battery compartment.
4. Re-attach the battery compartment cover with the two screws.

# Cautions and Warnings

1. Always follow basic safety precautions when using this product to reduce risk of injury, fire or electric shock.
2. Batteries may explode or leak and cause burn injury if disassembled.
3. **Use ONLY the charger and battery supplied with the Bio-Pump® Plus. Using a different battery or charger can damage the pump or cause injury from explosion.**
4. Do not submerge the pump or subject the pump to any liquids.
5. Do not open the pump case.
6. Do not block the vent holes under the unit.

## Limited Warranty

*Zefon* International warrants the Bio-Pump® Plus for a period of 1 year from date of purchase. *Zefon* will without charge repair or replace, at its option, the defective pump or component parts upon delivery to its repair facility.

This limited warranty covers defects in workmanship and material. It does not apply to:

1. Product damage by accident or weather related circumstances.
2. Misuse or abuse of product as a result of unauthorized repairs or alterations.
3. Lack of proper care and maintenance.
4. Failure to follow instructions.
5. Any damage from attempting to use cassettes other than *Air-O-Cell®*, *Via-Cell®*, or *Air-O-Cell®* CSI.
6. Any damage resulting from sampling outside the scope of *Zefon's* recommendations for use.
7. Items that need to be replaced as a result of normal use (e.g. batteries).

Note: Do not open the Bio-Pump® Plus housing. Damage may occur to the pump and all warranties will be immediately voided.

If it should become necessary to return the pump for service, please call *Zefon* at 352-854-8080 for a return authorization number and return instructions. Please have the unit serial number and a description of the problem handy. All units returned must be complete with the pump, case, charger and flow indicator for a complete evaluation. Units returned without all of these items cannot be thoroughly evaluated by our service department. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. **A return authorization number must be issued prior to shipment and must be marked on your shipment.**

## Disclaimer

*Zefon* shall not be liable for direct, indirect, consequential, incidental or other damages resulting from the sale or use of any goods including lack of use due to equipment failure. *Zefon's* total liability shall be limited to repair or replacement of the product.

*Zefon* assumes no responsibility whatsoever to any party whatsoever for any property damage, personal injury or death received by or resulting from, in whole or in part, the improper use or storage of this product by the user, person, firm, entity, corporation or party not adhering to the instructions and warnings in this manual.

# Maintenance

Proper care and maintenance of your Bio-Pump® Plus is essential for a long useful life. It is a delicate electronic device and should be treated accordingly. Rough and abusive use and/or accidental impacts may damage the unit. *Zefon* offers the following guidelines in caring for your equipment.

1. Keep the unit clean and free of dust and dirt. It may be wiped down with a clean dry cloth.
2. Keep the battery charged. Charge periodically when not used for a prolonged amount of time or leave plugged in for a continuous trickle charge.
3. Always store Bio-Pump® Plus in its case for proper protection.
4. Do not ship the Bio-Pump® Plus using the carrying case as the shipping container. The case is not designed to be a shipping container and damage may occur.
5. Do not attempt to oil the motor. The motor is designed to be maintenance free.
6. Do not store the unit in extreme heat for any extended period of time.



ZA0043 Heavy Duty  
Tripod Sampling Stand



ZBP-200-CAL shown.  
Bio-Pump® sold separately.



ZBP-310 Remote Extension  
shown attached to Bio-Pump®

## Optional Accessories

Heavy Duty Tripod Sampling Stand  
Primary Calibrator Kit with TSI 4046 Calibrator  
Remote 5' Extension Tubing

ZA0043  
ZBP-200-CAL  
ZBP-310

## Replacement Parts

Replacement Bioisolation Filter  
Replacement Flow Indicator (*Air-O-Cell*®)  
Replacement Flow Indicator (*Via-Cell*®/*Air-O-Cell*® CSI)  
Replacement AC Power Adaptor, 100v-240v  
Replacement/Spare Battery  
*Air-O-Cell*® Cassettes (10/pk)  
*Air-O-Cell*® Cassettes (50/pk)  
*Via-Cell*® Cassettes (10/pk)  
*Air-O-Cell*® CSI Cassettes (2/pk)  
*Air-O-Cell*® CSI Cassettes (10/pk)

ZA0047  
ZBP-302  
ZBP-305  
ZBP-304  
ZBP-300  
AOC010  
AOC050  
VIA010  
CSI002  
CSI010



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