



**Tisch Environmental**  
**TE-3000P**  
**Portable High Volume Enzyme Sampler**



## TE-3000P Portable High Volume Enzyme Sampler



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# 1.0 Introduction

Tisch Environmental, Inc. is a third-generation family owned business located in Cleves, Ohio. The owners Wilbur J. Tisch and James P. Tisch have been involved in the High Volume Air Pollution field for the last 20 years, and have remained on the forefront of the manufacturing and design of environmental testing products since the emergence of Tisch Environmental, Inc. in March 1998. Their expertise is evident in the creation and assemblage of Tisch Environmental products and in the long-standing tradition of personal business practices at Tisch Environmental. They would like to welcome you to their company and thank you for choosing Tisch.

## 1.1 Contact Us

If you require assistance please contact us:

**Toll Free:** (877) 263 -7610  
**Direct:** (513) 467-9000  
**Fax:** (513) 467-9009  
**Email:** sales@tisch-env.com  
**Website:** www.tisch-env.com  
**Address:** Tisch Environmental, Inc.  
145 South Miami Ave.  
Cleves, OH 45002

## 1.2 Patents, Copyrights, Trademarks

Tisch Environmental, Inc. instrumentation is protected by patent in the United States of America. The distribution or duplication of Tisch Environmental, Inc. products, designs, or trade secrets is prohibited without the express written consent of Tisch Environmental, Inc.

## 1.3 Warranty

Instruments manufactured by Tisch Environmental, Inc. are guaranteed by warranty to be free of defects in materials and workmanship for one year after shipment from Tisch Environmental factories. The liability of Tisch Environmental, Inc. is limited to servicing or replacing any defective part of any instrument returned to the factory by the original purchaser. All service traceable to defects in original material or workmanship is considered warranty service and is performed free of charge. The expense of warranty shipping charges to and from our factory will be borne by Tisch Environmental. Service performed to rectify an instrument malfunction caused by abuse, acts of god or neglect, and service performed after the one-year warranty period will be charged to the customer at the current prices for labor, parts, and transportation. The right is reserved to make changes in construction, design specifications, and prices without prior notice.

## 1.4 Equipment Description

The TE-3000P is especially suited for intermittent verification and determination of airborne particulate levels. Utilizing a 4" diameter filter paper of various types, the unit traps particles to .01 microns.

The peripheral by-pass design of the blower motor allows independent discharge of the sampled air. Motor cooling is provided by a separate fan section. This feature provides longer sampling periods without motor burnout.

The "swing away" bolts on the filter holder facilitate paper replacement and eliminate damage to the filter media while clamping.

The sampler unit is assembled ready for operation with filter holder, integrated digital timer, on/off/timer switch, integral handle, rubber tipped feet and polarized electrical cord.

## Applications

- In-plant pollution levels
- Spot-checking suspected sources of pollution
- Verifying industrial hygiene standards
- Checking compliance measurements in isolated areas
- Compact "sample anywhere" design
- Lightweight, heavy-duty industrial construction

## 1.5 Ordering Information

<b>Part Number</b>	<b>Description</b>
TE-3000P	TE-3000P Portable Industrial Hygiene sampler
TE-3000PS	TE-3000P Portable Industrial Hygiene air sampler with tripod stand
TE-HVC-H	X-Calibrator high volume calibration system with horizontal display and carrying case
TE-5026	Calibration orifice with 3 plates, u-tube manometer, tubing and flowmeter
1822-110	Glass fiber filter paper, 110 mm, GF/C

## 1.6 Declaration of Conformance

**We** Tisch Environmental, Inc.  
**Of** 145 South Miami Ave, Cleves, OH 45002

***In accordance with the following directive(s):***

Council Directive 2006/42/EC Machinery;  
Council Directive 2004/108/EC on Electromagnetic Compatibility;

***Hereby declare that:***

Equipment: TE-3000P Industrial Hygiene Sampler  
Model Number: TE-3000P

***Listing of European Standards Used:***

- EN 61010-1:2010, Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 1: General Requirements.
- EN 60204-1-:206/AC:2010, Safety of machinery – Electrical equipment for machines – Part 1: General requirements.
- EN ISO 12100:2010, Safety of machinery – General principles for design – Risk assessment and reduction.
- EN 61326-1:2013, Electrical equipment for measurement, control, and laboratory use – EMC requirements – Part 1: General requirements.

***I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced standards. The unit complies with all applicable essential requirements of directives.***

A handwritten signature in blue ink, appearing to read "Bob E. Tisch".

Name: Bob E. Tisch, PE  
Title: Director of Research and Development  
Tisch Environmental  
145 South Miami Ave, Cleves, OH 45002  
On: 25 November 2015

## 2.0 Safety Precautions

Before using Tisch Environmental products, always be sure to review the corresponding operations manual and take all necessary safety precautions. Tisch Environmental products are to be used only for the purposes specified by the operations manual. Tisch Environmental cannot guarantee the safe usage of its instruments in procedures that do not adhere to Tisch Environmental guidelines and standards. If you have concerns about the safety of your product or questions about safe practices, contact Tisch Environmental by phone or e-mail to speak with a representative.

### 2.1 Symbols used in this document

The following symbols are used in this document



Shock hazard – this symbol is used to alert the operator that there is a potential for an electrical shock hazard.



General Attention – this symbol is used to alert the operator of an important directive.



High noise – this symbol is used to alert the operator that there is a potential for high noise hazards and that proper hearing protection should be used.



High temperature – this symbol is used to alert the operator that there is a potential for surfaces to have a temperature high enough to burn the skin.



Moving parts – this symbol is used to alert the operator that there are moving parts with pinch points that can injure or entangle loose clothing, jewelry, etc.

## 2.2 Safety Warnings

### General



Service and repair of this instrument should only be attempted by a trained technician whom is familiar with electrical safety.



When in operation, hearing protection must be worn at all times when proximity is within 2.0 feet of the unit.



After operation, the housing of the blower will become hot to the touch. Handle the unit only by the handle and do not touch the blower housing until it has cooled.



Ensure when removing the filter holder that the unit is completely powered down and the cord removed to prevent the unit from starting. Behind the filter holder is the motor housing which is a pinch point

### Electrical



Do not remove the inner enclosure covers without disconnecting mains power and powering down the unit completely.



Use grounded electrical connections at all times to prevent inadvertent electrical shock hazards.



Use only an approved CE-listed cord. The cord must be rated for the environment used and the current and voltage rating of the instrument.

## 3.0 Specifications

<b>Environmental</b>	For indoor use only Enclosure rating IPX0 No wet locations Altitude up to 2000 m Temperature rating 5°C to 40°C Maximum relative humidity 80% @ 31°C max to 50% at 40°C Pollution degree 2
<b>Sound level</b>	A weighted sound pressure level at 1M from the operator controls of 87.5 dB(A)
<b>Weight</b>	10.43 Kg (23lbs)
<b>Dimensions</b>	17.8cm x 31.75 x 17.8 (7 In. x 12.5 x 7)
<b>Electrical</b>	<b>220VAC Operation</b> Nominal Voltage: 220V / 50hz Mains Maximum Voltage: 240V Current: 5 Amps Fuse: 7 Amp Time-lag fuse  <b>120VAC Operation</b> Nominal Voltage: 120V / 60Hz Mains Current: 8 Amps Fuse: 15 Amp Time-lag fuse  Mains supply fluctuations up to $\pm 10\%$ of nominal voltage  Overvoltage Category II  Connection: Detachable cord set, IEC-320 socket to accept an IEC-320 C13 cord set Overvoltage category: II
<b>Duty</b>	Not for continuous use. Typical sample runtime is 60 minutes.

## 4.0 Operation

### 4.1 Unpacking / Assembly / Installation

The TE-3000P is shipped in a single box. Open the box from the top, do not open the box from the bottom. Lift the unit from the box by grabbing the handle and pulling it from the box.

Remove the (2) Screws that secure the unit to the shipping plywood.

The TE-3000P comes completely assembled with the 4 inch filter holder attached and ready for installation.

**NOTE:** The TE-3000P should be installed on a flat surface in an upright position or onto the optional stand. Ensure there is adequate space around the vacuum portion of the unit (the side with the filter holder) to ensure proper particulate or enzyme collection.

**NOTE:** Ensure the holes on the motor housing have plenty of ventilation for cooling of the unit.

### 4.2 Filter Holder Removal and Filter Placement



Ensure when removing the filter holder that the unit is completely powered down and the cord removed to prevent the unit from starting. Behind the filter holder is the motor housing which is a pinch point

The filter holder can be removed for cleaning or maintenance by loosening the set screw with a 5/64 allen wrench and unscrewing it from the motor housing after the unit is powered down by turning off and removing the cord.

The filter is placed in the unit by unscrewing the black knobs on the (3) brass swing bolts. Remove the outer filter holder frame. Place one of the Teflon gaskets into the filter holder frame, then a clean filter and finally a second Teflon gasket so the filter is placed between the (2) Teflon gaskets.

Place the filter holder frame with the clean filter onto the filter holder and secure with the (3) black knobs on the (3) brass swing bolts.

**NOTE:** Ensure not to tighten the black knobs too tight as the filter could be torn. Only tighten snug and finger-tight.

### 4.3 Placing the TE-3000P on a tripod stand

To place the TE-3000P on the optional tripod stand you will need the tripod stand and the mounting plate.

Extend the legs of the stand to the proper height by loosening the front knob. After desired height is achieved, tighten the black knob securing the legs of the stand.

Place the mounting plate onto the top of the stand by placing it over the stand top mate. Secure the plate to the stand with the bolt by placing it through the hole on the plate and through the stand top and secure the bolt with the black knob.

Place the TE-3000P onto the mounting plate and fit the 2 bolts on the plate into the stand mounting-holes of the TE-3000P. Secure the TE-3000P to the stand plate with (2) black knobs.

### 4.4 Electrical Connection

The TE-3000P has a standard IEC-320 socket that will accept an IEC-320 C13 cord set.



Use grounded electrical connections at all times to prevent inadvertent electrical shock hazards.



Use only an approved CE-listed cord. The cord must be rated for the environment used and the current and voltage rating of the instrument.



Before plugging unit into AC Mains power ensure the ON / OFF / TIMED switch is in the center OFF position.

### 4.5 Operation of the TE-3000P



When in operation, hearing protection must be worn at all times when proximity is within 2.0 feet of the unit.



After operation, the housing of the blower will become hot to the touch. Handle the unit only by the handle and do not touch the blower housing until it has cooled.

Operation of the TE-3000P is accomplished from the ON / OFF / TIMED switch located on the instrument's side.



Switch Position	Description
ON	Unit will run continuously
OFF	Unit will be off
TIMED	Unit will operate from the timer

**To turn the instrument OFF at any time, turn the switch to the center OFF position.**

## Turning Instrument On

To run the instrument continuously, turn the switch down to the ON position. The unit will run until switched off or unplugged from mains power.

## Running Instrument on Timer

To run the instrument on a timed setting perform the following:

1. Turn the switch to the TIMED position. The timer will activate and power on. The timer takes a few seconds to boot. When it is ready it will show OFF on the screen
2. Press the SET button on the timer, the timer will show zero on the screen.



3. Use the UP / DOWN arrows on the timer to change how long the instrument should operate in minutes.
4. When the desired time is shown on the timer screen press the SET button and the instrument will turn on and operate. The timer will count down and when it reaches zero, will automatically turn off.

### 4.3 Calibration Procedure using TE-5026 Calibration Kit



TE-5026 Calibration Kit

Proceed with the following steps to begin the calibration:



When removing the filter holder, ensure that the unit is completely powered down and the cord removed to prevent the unit from starting. Behind the filter holder is the motor housing which is a pinch point

1. Power down the unit and unplug from mains power
2. Remove the 110mm filter holder from the inlet of the air sampler by unscrewing it from the motor housing.
3. Install the #3 calibration plate in the calibration orifice and attach to the sampling pump. (A gasket goes on each side of the calibration plate.)
4. Plug the air sampler into correct voltage source.
5. Turn the unit on and allow the pump to warm up for approximately five minutes.
6. Open both fittings on top of the U-Tube manometer.
7. Zero the manometer.
8. Attach one end of the tubing to the pressure tap on the calibrating orifice and the other end to either fitting post of the U-Tube manometer.
9. With the #3 calibration plate in place and the sampler running, adjust the float (if necessary) to “8” on the flowmeter.



10. Observe the inches of water on the U-Tube manometer. Read at eye-level and add both sides of the manometer.
11. Record the “float” reading and the U-Tube reading on the bottom of the flowmeter calibration chart paper.
12. Turn the unit off and unplug from voltage source. Insert the #2 plate, turn unit on, observe the inches of water on the U-Tube manometer by, again, taking a reading at eye-level and adding both sides of the manometer.
13. Record the “float” reading and the U-Tube reading on the bottom of the flowmeter calibration chart paper.
14. Turn the unit off, insert #1.5 calibration plate, turn the unit on, and observe the inches of water on the U-Tube manometer.
15. Record the “float” reading and the U-Tube reading on the bottom of the flowmeter calibration chart paper.
16. Turn the unit off and disconnect from power source
17. Remove the tubing from the calibration orifice and the U-Tube manometer.
18. Remove the calibration orifice from the unit.
19. Place 4” filter holder back onto unit and return to normal operation.



## **Plotting the Calibration Curve**

1. From the data recorded at the bottom of the flowmeter calibration chart and using the “Air Sampler Calibration Curve,” develop a calibration curve for the air sampler. See Attachment 3 for example.
  - a. For each number in the “inches of water” column, move the required number of spaces vertically on the y-axis. Each space = 0.1.
  - b. When reaching the required number of spaces on the y-axis, move horizontally along the x-axis until an intersection is reached.
  - c. Drop vertically to the x-axis to find the Actual Flow Rate.
  - d. Record this number in the “Actual Flow Rate” column on the flowmeter calibration chart.
2. Repeat this procedure for each plate reading.
3. Using the Flowmeter Reading and Actual Flow numbers obtained in the first two steps, develop a calibration curve for the pump.
  - a. Using the flowmeter reading number, proceed horizontally along the x-axis until reaching the desired number.
  - b. Proceed vertically up the y-axis until the number in the Actual Flow column is reached.
  - c. Place a mark where these two numbers intersect.
  - d. Repeat this procedure for each set of data points.
4. Using a protractor or a straight edge or flexible ruler, connect the three marks on the chart with a continuous line. **This is the flowmeter calibration curve for the air sampler.**
5. On the flowmeter calibration chart, record the air sampler pump number, calibrator number, and the date of calibration.

## Determining Air Sampling Flow Rate

1. Place a clean unused GF/C 10/11 cm. filter in the air sampler filter holder, tighten and make sure there are no leaks.
2. Turn air sampler on and read the flow meter gauge.
3. Turn unit off.
4. Using the flowmeter gauge reading, move horizontally along the x-axis to the number on the chart that corresponds to the number on the gauge.
5. Move vertically (y-axis) until the line intersects with the curve.
6. Move horizontally to the left (y-axis) to obtain the Cubic Feet per Minute (CFM) reading for the air sampler. This number (CFM) is to be used until the next calibration date.
7. Record this number on the flowmeter calibration chart
8. Place this record and all other calibration records in a notebook.

## 5.0 Maintenance and Troubleshooting

A regular maintenance schedule will allow a monitoring network to operate for longer periods of time without system failure. Our customers may find that the adjustments in routine maintenance frequencies are necessary due to the operational demands on their sampler(s). We recommend that the following cleaning and maintenance activities be observed until a stable operating history of the sampler has been established.

### 5.1 Replacement Parts and Accessories

Replacement Motor for 220V Units	TE-114789
Replacement Motor for 120V Units	TE-114787
Replacement Brush Set, 4pc. For 220V Units	TE-3000P-8
Replacement Brush Set, 4pc. For 120V Units	TE-3000P-3
Aluminum Housing	TE-3000P-18
Aluminum Cap Ring	TE-5035-2
Housing Seal Gasket, Neoprene	TE-3000P-16
Cap Ring Compression Gasket, Neoprene	TE-3000P-15
Power Cord Set, 6ft.	TE-W-209
Flowmeter	TE-10453
Replacement Fuse, 7 amp for 220V Units	TE-3000P-100
Replacement Fuse, 15 amp for 120V Units	TE-3000P-21
Aluminum Handle Bracket	TE-3000P-14
Motor Cushion, 4"ID x 7"OD, Silicone	TE-3000P-17
Filter Holder, Round, 4"	TE-1008
Teflon Gasket, Top	TE-1008-5
Teflon Gasket, Bottom	TE-1008-5
Calibration Kit, Complete	TE-5026
Tri-Pod Stand for TE-3000P	TE-3000P-1
Tri-Pod Mounting Plate for TE-3000P	TE-3000P-36

## 5.2 Fuse Replacement

The fuse for the TE-3000P is located in the power inlet



**CAUTION: REMOVE POWER FROM UNIT BEFORE SERVICING**

To replace the fuse, use a small flat-head screwdriver to open the tray of the power inlet where the fuse(s) are located.

Remove the blown fuse(s) and replace with new fuse(s)

Fuse information:

220V Systems: P/N: TE-3000P-100 – 7 Amp, time-lag 5x20mm fuse

120V Systems: P/N: TE-3000P-21 - 15 Amp, time-lag 5x20mm fuse

## 5.3 Air flow Troubleshooting

If the flowrate of the unit is reading high or low, first check that a filter is placed on the unit and that the filter is not torn. Have a qualified person check the voltage applied to the unit to ensure the proper voltage is applied to the unit. Check that the ventilation holes on the motor are not clogged. Disconnect power and check the motor brushes for wear.

## 5.4 Motor Brush Replacement



**CAUTION: REMOVE POWER FROM UNIT BEFORE SERVICING**

Tools needed to change brushes on the TE-3000P High-Volume Air Sampler:



- 5/16" Nut Driver
- 6" flat blade screwdriver

1. Remove the brush holder caps and set aside. This exposes the four brush assembly clips (TE-5172).



2. Remove the copper brush assembly clips to release the brush and spring assemblies (TE-10542).



3. Remove the two brush mechanisms (TE-33300). Set aside the brush mechanisms.



4. Insert new carbon brushes in the brush holders and secure with the four brush assembly clips.
5. Attach the two brush holder caps with the four acorn nuts.



The brush change is now complete.

## Appendix A: Revision History

<b>Revision</b>	<b>Date</b>	<b>Description</b>
1.0	9/15/14	Manual created
2.0	3/21/15	Manual updated per CE testing report 101944979COL-001a by Intertek Testing Laboratories
2.1	11/20/15	Updated manual per CE Machinery Directive Added DoC in section 1.6