

# TG-14 inline HPLC Mobile Phase Degasser

## OPERATING AND INSTRUCTION MANUAL



*Sold and Serviced by*



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*Version 12.11.06.1*

# 1. Before Using the TG-14 Degasser

## 1-1: Preface

Thank you for purchasing Model TG-14. Please read the following instructions carefully for secure operation.

- This manual is designed to teach the user how to handle the Degasser safely, and prevent mechanical malfunctions and dangerous accidents.
- To achieve maximum level of safety, please study the instruction manual thoroughly and carefully before installing / operating the Degasser.
- Please follow **ALL** the safety precautions and instructions to ensure the safety of user.
- When using the Degasser, please keep this manual handy for a quick reference and store it in a safe place afterwards for future use.
- The safety rankings are coded **Caution**, **Warning**, and **Danger**. The definition of each code is explained in the next page under the heading "Safety Precautions". Do not operate the Degasser under any circumstances if any one of the safety instructions cannot be followed.

1. MicroSolv Technology Corporation is not liable for accidents that occurred under the following conditions:

- ① When the owner employed the Degasser for purposes prohibited by the Instruction Manual.
- ② When parts and accessories made by other manufacturers and not listed in the Instruction Manual were installed to operate the Degasser.
- ③ When the Degasser was used for purposes not stated in the contract.
- ④ When the users performed unauthorized modifications of the Degasser.
- ⑤ When the users fail to follow the safety instructions explained in the Instruction Manual.

2. If you need to modify your Degasser, please contact MicroSolv Technology Corporation. Our qualified engineers will make necessary modifications.

3. To maintain the best performance, the Degasser should be cleaned periodically.

4. Place the Degasser away from hazardous materials.

5. A limited product warranty is attached at the end of this manual. Please store it in a safe place to avoid accidental loss. In case of loss, contact MicroSolv Technology Corporation immediately and provide product's model type, serial number, and special modifications (if custom-made). Please note that the product may not be covered under the same conditions specified in the warranty once it is lost.

## 1-2: Safety Precautions

Before starting up the Degasser, please read this Instruction Manual thoroughly and carefully. Understanding the functions and safety procedures of the Degasser is critical to the safety of its user. We recommend that the Instruction Manual is to be stored in a place easily accessible to anyone for the safe operation of the Degasser.

The signs described below appear throughout this manual whenever the safety precaution is warranted, along with the reasons stated next to them. Please read them carefully and thoroughly each time they appear.



This sign indicates possible damage to the Degasser, or minor injury to anyone operating it.



This sign indicates the possibility of a serious accident, causing fatal damage to the Degasser or serious injury to its user.



This sign indicates the high probability of a serious accident, causing fatal injury to the user.

## 2. List of Accessories

After opening the package, please make sure that all the accessories listed below are included in the box.

Product Name	Part No.	Quantity
Power Cord	0018	1
3P Connector	0019	1
Fuse (0.8A)	0020	2
Suction Needle	0005	1
1/8" Flat Seal Fitting (PEEK)	9711	9
1/8" Flat Seal Ferrule (ETFE)	9702	9
1/8" X 2mm PTFE Tube (1m)	7006	4
Instruction Manual	0022	1

Important Note: If you find any of the accessories listed above defective, please notify MicroSolv Technology Corporation immediately. If malfunctions are caused by accessories not manufactured or sold by MicroSolv Technology Corporation, the warranty will not cover the cost of repair.

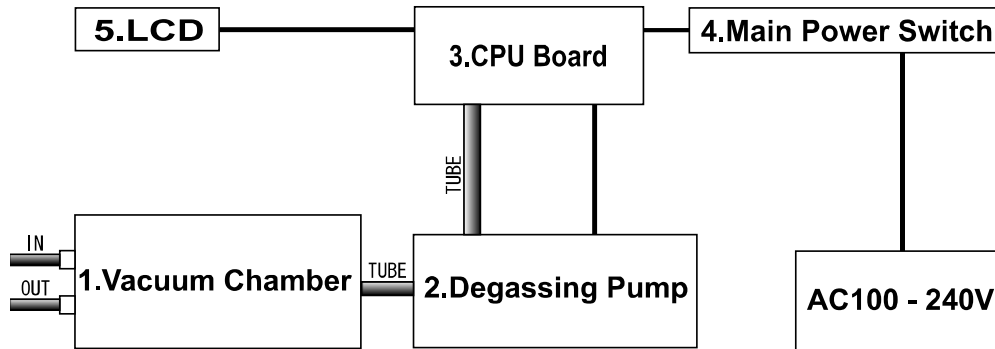
### 3. Technical Specifications

Model	TG-14 (Analytical)
Degassing Method	PTFE Membrane filtering
No. of channels	4 channels
Max. flow rate	5 ml/min
Flow volume	5 ml per channel
Range of control	100 – 105 hPa
Vacuum pump	Plunger pump with automatic self cleaning system
Vacuum system	Vacuum pressure sensor and CPU control of pressure level
Display	One backlight LCD digital display
Wetted material	PTFE, ETFE, PPS, PEEK
Power voltage	AC100 – 240 V1.0A
Dimensions (mm)	137.8(H) X 66(W) X 357.6(D)

Note: All the specifications listed above are subject to change without notice.

#### 4. How the Degasser Works

##### 4-1: Inside the Degasser

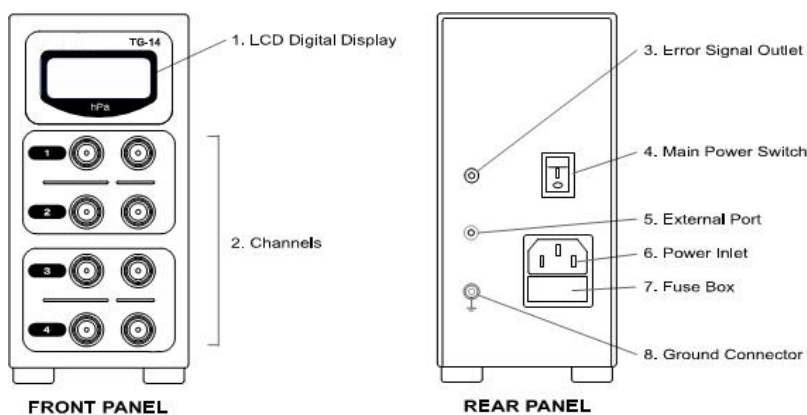


- |                        |  |
|------------------------|--|
| 1. Vacuum Chamber      | The vacuum chamber contains densely packed membrane filters and maintains precise vacuum level with the degassing pump.                          |
| 2. Degassing Pump      | The degassing pump, totally redesigned for the prevention of condensation inside the vacuum chambers, is CPU-controlled for precision degassing. |
| 3. CPU Board           | The CPU Board controls all parts of the Degasser for precision degassing, automatic cleaning, and error detection.                               |
| 4. Main Power Switch   | The main power switch controls the power supply of the Degasser. The acceptable voltage is between 100 to 240V.                                  |
| 5. LCD Digital Display | The LCD digital display shows pressure level inside the vacuum chambers. It also indicates error type when there is a malfunction.               |

## 5. Panel Functions

### 5-1: Front/Rear Panel

Name	Function
1. LCD Digital Display	Shows pressure level in the vacuum chambers and indicates error types.
2. Channels	Connect tubes from the pressure pumps and solvent containers. (Thread size: No.1/4-28UNF)
3. Error Signal Outlet	Transmits error signals to another device.
4. Main Power Switch	Switches on/off the Degasser.
5. Exhaust	Discharges the air removed from the solvent. When degassing a hazardous solvent, make sure to connect a tube to the port and let the air discharged safely away from the room.
6. Power Inlet	Connects the power plug to the Degasser.
7. Fuse Box	Contains two fuses to protect the Degasser from a sudden power shock.
8. Ground Connector	Connects the Degasser with a grounding wire.



## 6. How to Install

### 6-1: Unpacking

Open the package carefully. Remove the Degasser and all the accessories from the packing material and compare each of them with the list of accessories on page 3.

### 6-2: Connecting to the power supply

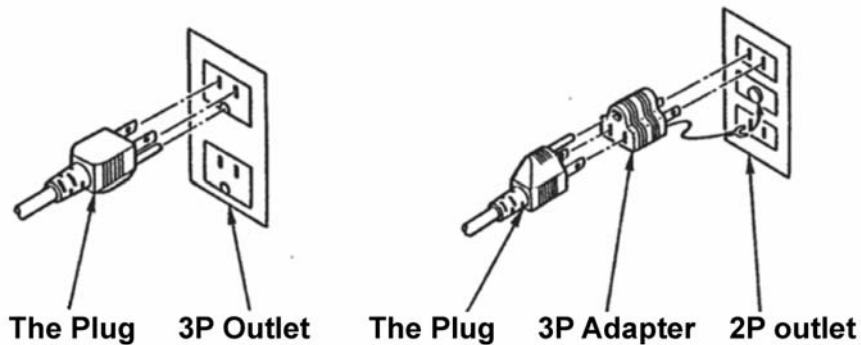


*WARNING! Hold the plug firmly when connecting to the power outlet. Keep the plug dry to prevent electric shock.*



*CAUTION! If the power outlet is plugged with other high power electric devices, obtain another power source for the the Degasser to avoid sudden power shortage.*

Connect the end plug of the Power Cord to the AC Power Inlet located on the rear panel and then connect the plug to the power outlet (the acceptable power voltage is from AC100V to 240V, and Wave Length is 50/60 Hz). If the outlet only accepts plugs with two prongs, use the 3P Adapter as shown in the picture to attach the grounding wire. If no grounding connection is available, we recommend the user to contact an electrician and upgrade the outlet. Under no circumstance use the outlet without ground connection.

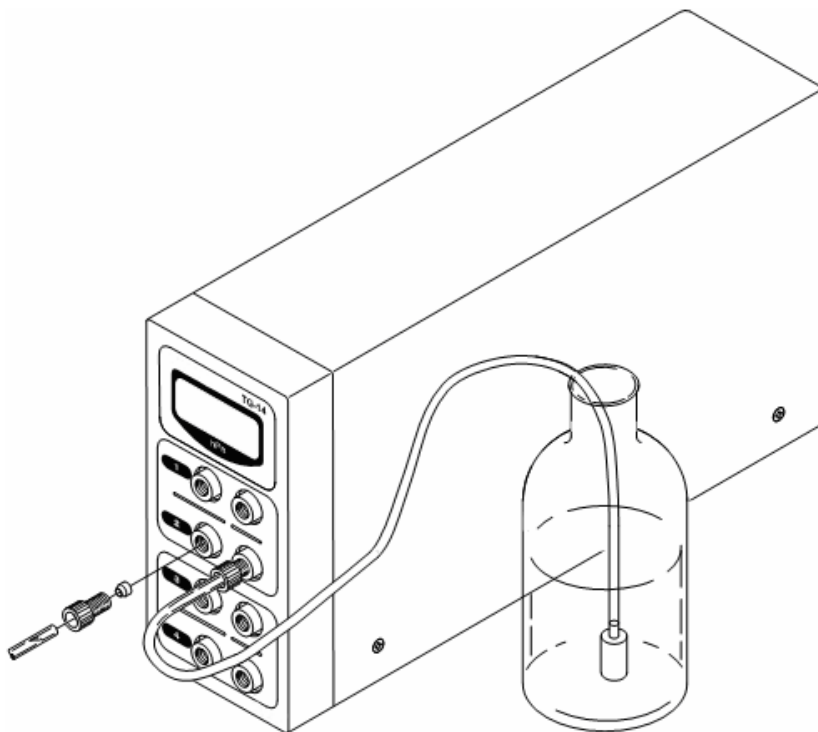


### 6-3: Tubing

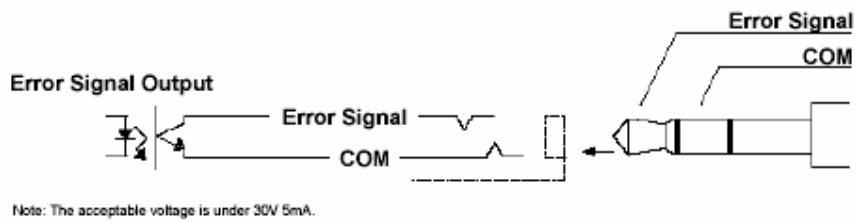


The Degasser is designed to degas the mobile phase before it enters the pressure pump. Place the Degasser between the solvent container and the pressure pump for proper tubing. Do not connect the Degasser to the pressure pump outlet. High pressure may seriously damage the Degasser.

- Remove the white blind caps on two connectors of each channel that you are about to use. Keep the blind caps on other connectors to protect them from dust.
- Turn on the main power switch located on the rear panel.
- Connect the inlet tube and the outlet tube on the channel of your choice. They can be connected on either connector as long as they stay on the same channel. There are no designated inlet or outlet connectors.
- Turn on the pressure pump and let the solvent flow (about 1 ml/min in volume).
- Now the setup is complete. The pressure level should be shown on the LCD display.



## 7. Error Signals



### 7-1: About error signals

The Degasser is equipped with an error signal outlet located on the rear panel. When connected with a cable, it can transmit error signals (a malfunction of motor or degassing pump) to another device.

### 7-2: Error Code

When there is a malfunction, the error type will be shown on the LCD display as Er 1, Er 2, or Er 3. The meaning of each error code is described as follows:

**Er 1.....**This error code indicates the motor failure. This appears on the LCD display when the motor fails to activate after three attempts. The Degasser will shut down automatically.

**Er 2.....**The error code indicates the degassing failure. This appears on the LCD display when the vacuum chamber fails to reach the proper pressure level. The Degasser will shut down automatically.

**Er 3.....**This error code indicates irregularity in power voltage. This appears on the LCD display when the AC adapter fails and results in voltage irregularity.

## 8. Safety Instructions

### 8-1 While Using the Degasser



- Do not pour or splash any liquid on the Degasser. If the solvent is splashed on any part of the Degasser by accident, turn off the main power switch immediately and pull the plug off the outlet before wiping off the solvent. Do not turn on the power switch until the solvent on the Degasser has dried out completely, or it may cause fire, electrocution, or malfunction of the Degasser. If the solvent has seeped inside the Degasser, please contact MicroSolv Technology Corporation immediately.
- Do not stick any sharp materials or pour any type of liquid through the ventilation openings located on the sides of metal casing. It may cause fire, electric hazard, or a malfunction of the Degasser.
- When you move the Degasser, make sure to turn off the main power switch and pull the plug off the outlet. Touch neither the main power switch nor the plug with wet hands.
- Do not place the Degasser where it could easily fall, such as at the edge of the table. If the outlet is too far for the power cord to reach, use an extension cord with a grounding-type plug.
- Protect the power cord from being walked on. Do not pinch the power cord. Insert the plug firmly into the outlet to avoid the exposure of prongs.
- **DO NOT DISASSEMBLE THE Degasser AND ATTEMPT TO FIX OR MODIFY IT YOURSELF!** If you desire to modify the Degasser, or to fix the Degasser that is malfunctioning, contact MicroSolv Technology Corporation and let our qualified engineers repair the Degasser or make necessary changes. Under no circumstance remove the metal casing. Any malfunctions caused by modifications by any person other than authorized MicroSolv personnel will not be covered by the warranty. MicroSolv Technology Corporation takes no responsibility for any personal injuries or mechanical damages caused by unauthorized modifications.



- Do not use the Degasser in an outdoor environment.
- Do not put the Degasser in the abnormal position (such as laying on its side or standing on its rear panel). The Degasser may malfunction if not used in a proper position.
- Keep the Degasser away from corrosive gases.
- Do not place the Degasser nearby high-voltage electronic devices. It may degrade the performance of CPU board inside.
- Do not place the Degasser in direct sunlight.
- Do not operate the Degasser in the environment where temperature fluctuates rapidly. The room temperature should be within the range of 10C and 40C.
- The acceptable voltage for the Degasser ranges from AC 100V to 240V (50/60Hz). Do not deviate from this voltage range or it may cause fire or electric shock.
- When you detect abnormality during the operation, turn off the main power switch immediately and check the tube connections and the power cord. If no visible problems are detected and the abnormality persists, contact MicroSolv Technology Corporation immediately. When left unattended, it may cause fire or electric shock.
- Do not bent, step on, or stack heavy materials on the power cord. Do not bundle the power cord with other power cords. The heat may cause fire or electric shock.
- Do not place the Degasser nearby any heat sources. It may damage the Degasser or cause fire.
- Do not use any tools to tighten the nut connecting a tube to the channel connector. Over-tightening may damage the nut, tube, and connectors. Always use hand to tighten the nut. **“Firm feeling” is sufficient for proper tightening.** Do not use any nuts or ferrules manufactured by companies not authorized by MicroSolv Technology Corporation.
- Some solvents leave solid crystallized substance inside the channel connectors and on the thread part of nuts and ferrules when they vaporize. Make sure to clean them before using, or the connectors may be damaged and cause solvent leakage.
- Make sure to remove all the remaining solvents inside the Degasser and clean the tubes before storing.
- Do not attempt to degas solvent with high viscosity. It may clog the vacuum chambers.

## 9. Replacement Parts

### 9-1: List of Replacement Parts

Product Serial No.	Product Name	Quantity
0000	Blind caps (for channel connectors)	10
0005	Suction syringe	1
9711	1/8" flat seal fitting (No.1/4-28UNF)	10
9702	1/8" flat-seal ferrule	10
7006	1/8" x 2mm PTFE tube	10m

- When you place an order, make sure to include both the product name and the serial number on the order sheet.
- MicroSolv Technology Corporation is not liable for any malfunctions caused by using parts manufactured by other companies.

## 10. Maintenance / Troubleshooting



Please follow the instructions carefully for proper maintenance.

### 10-1: Replacing the Solvent

- To replace an organic solvent with a water-based solvent, we recommend users to flash out all remaining organic solvent with methanol. Some organic solvents may not dissolve in a water-based solvent and remain in the tubes.

### 10-2: Troubleshooting

In case of malfunctions, please contact MicroSolv Technology Corporation directly after following the procedure below:

1. **No power**
  - Check to see if both ends of the power cord are connected and inserted fully.
  - Remove the fuse box located on the back panel and check to see if the fuses need to be replaced.
2. **The vacuum pump does not activate**
  - Turn the main power switch off, and then on again to see if the vacuum pump can be activated. If the LCD display still shows error signs (Er 1, Er 2, or Er 3), contact MicroSolv Technology Corporation immediately for assistance.

## 11. Warranty Information

### MicroSolv Technology Corporation Statement of Limited Warranty

All of us at MicroSolv Technology Corporation thank you for purchasing the TG-14 Degasser. We provide a 1-year warranty, and it is subject to the following limitations:

1. This warranty herein applies only to the TG-14 Degasser and its accessories packaged together..
2. The liability of MicroSolv Technology Corporation and associates are limited to:
  - a. Replacement of the defective Degasser and/or its accessories listed on the List of Accessories.
  - b. The cost of repairing the defective the Degasser and its accessories including labor and replacement parts.
3. The warranty does not cover malfunctions caused by the following reasons:
  - a. The user failed to operate the Degasser according to the safety precautions and instructions explained in the instruction manual.
  - b. The user operated the Degasser with another equipment that was defective.
  - c. The Degasser was mechanically modified without a written authorization from MicroSolv Technology Corporation.
  - d. The user failed to follow the proper procedure explained in the instruction manual.
  - e. Degradation of the parts quality resulting from normal wear.
  - f. The user failed to notify MicroSolv Technology Corporation of the problem within 30 days from the date of occurrence.
  - g. The claimant failed to provide sufficient information regarding how the failure occurred.
  - h. The claimant failed to return the parts to MicroSolv Technology Corporation that he/she claimed defective.

This warranty is written by MicroSolv Technology Corporation. Neither party is responsible for incidental or consequential damages arising from this warranty such as a decrease in profits, loss of research data, and damage to other equipments. Limitations allowed on the

warranty vary from country to country, so certain limitations may not apply to you. This warranty gives you specific rights but you may have other rights according to laws of the country in which you reside. If you have any questions regarding this warranty, contact MicroSolv Technology Corporation at the address below:

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**Eatontown, NJ 07724**

**USA**

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