

Instruction Manual

GASTORR

On-Line Degassing System
Model AG-12 / AG-14

GASTORR Model AG-12 / AG-14

On-Line Degassing System

Instruction Manual

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1. Before Using GASTORR

1-1: Preface

Thank you for purchasing FLOM GASTORR AG series. Please read the following instructions carefully for secure operation.

- This manual is designed to teach the user how to handle the Gastorr 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 Gastorr.
- Please follow **ALL** the safety precautions and instructions to ensure the safety of user.
- When using the Gastorr, 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 Gastorr under any circumstances if any one of the safety instructions cannot be followed.

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

When the owner employed the Gastorr for purposes prohibited by the Instruction Manual.

When parts and accessories made by other manufacturers and not listed in the Instruction Manual were installed to operate the Gastorr.

When the Gastorr was used for purposes not stated in the contract.

When the users performed unauthorized modifications of the Gastorr.

When the users fail to follow the safety instructions explained in the Instruction Manual.

2. If you need to modify your Gastorr, please contact FLOM Corporation. Our qualified engineers will make necessary modifications.
3. To maintain the best performance, the Gastorr should be cleaned periodically.
4. Place the Gastorr 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 FLOM 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 Gastorr, please read this Instruction Manual thoroughly and carefully. Understanding the functions and safety procedures of Gastorr 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 Gastorr.

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 Gastorr, or minor injury to anyone operating it.



This sign indicates the possibility of a serious accident, causing fatal damage to Gastorr 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	Serial No.	Quantity
Power Cord	0018	1
3P Connector	0019	1
Fuse (0.8A)	0020	2
Suction Needle	0005	1
Flat Seal Fitting (PEEK)	9711	5 for AG-12 / 9 for AG-14
3.0mm Flat Seal Ferrule (ETFE)	9701	5 for AG-12 / 9 for AG-14
3.0mm X 2mm PFA Tube (1m)	7104	2m for AG-12 / 4m for AG-14
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Important Note: If you find any of the accessories listed above defective, please notify FLOM Corporation immediately. If malfunctions are caused by accessories not manufactured by FLOM Corporation, the warranty will not cover the cost of repair.

3. Technical Specifications

Model	AG-12 / AG-14 (Analytical)
Degassing Method*	Teflon membrane filtering
No. of channels	2 or 4 channels
Max. flow rate	5 mL/min
Flow volume	4.835 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 controlled pressure level
Display	Backlight LCD digital display
Wetted material*	Teflon, PPS, Chemraz
Power voltage	AC100 – 240V 1.0A
Dimensions (mm)*	AG-12: 100(H) X 66(W) X 285(D) AG-14: 144(H) X 66(W) X 285(D)

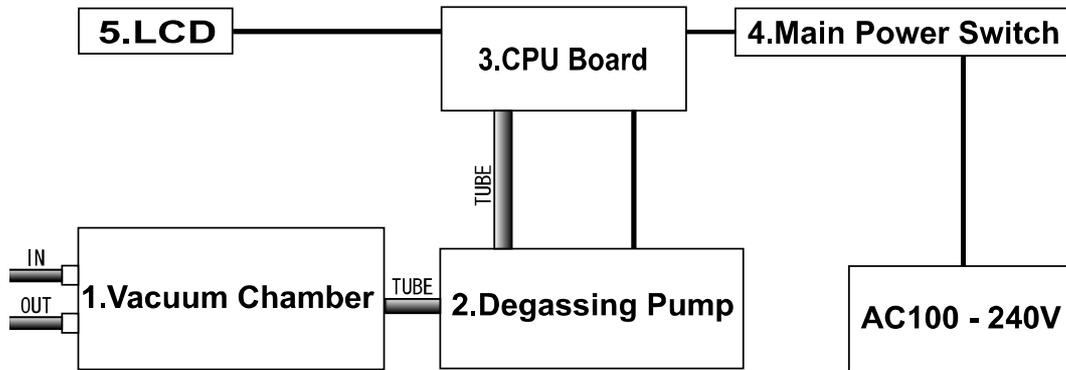
Note: All the specifications listed above are subject to change without notice.

Teflon and Tefzel are registered trademarks of DuPont.

Dimensions do not include lengths of external connection ports.

4. How GASTORR Works

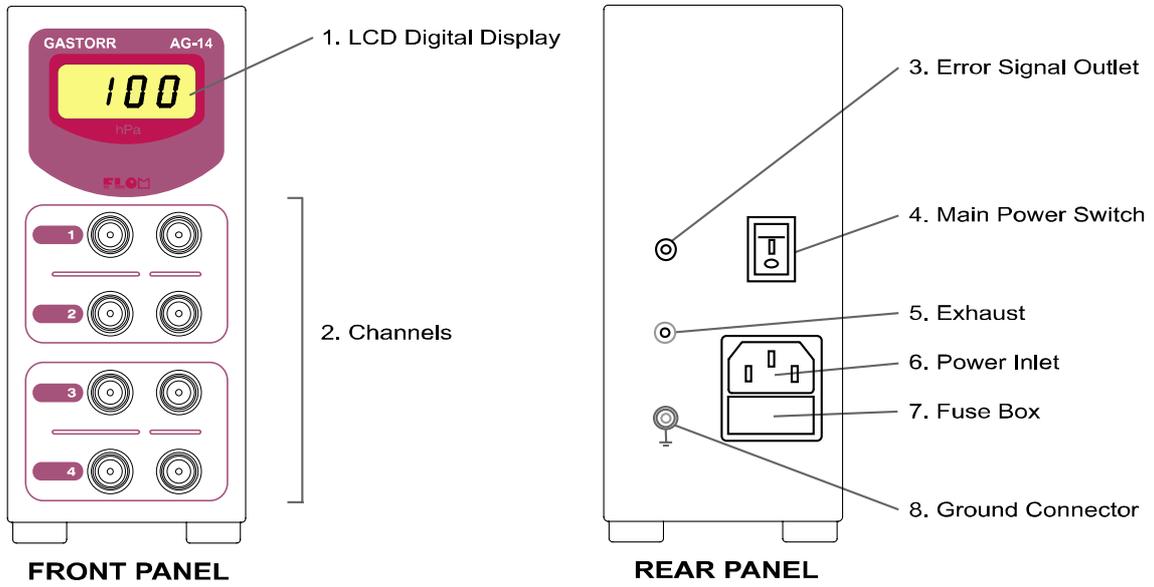
4-1: Inside the Gastorr



- | | |
|------------------------|--|
| 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, 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 Gastorr for precision degassing, automatic cleaning, and error detection. |
| 4. Main Power Switch | The main power switch controls the power supply of Gastorr. 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. Chambers	Connect tubes from the pressure pumps and solvent containers. (Thread size: No.1/4-28UNF)
3. Error Signal Outlet	Transmits error signals to another devise.
4. Main Power Switch	Switches on/off Gastorr.
5. Exhaust	Discharges the gas removed from the solvent. When degassing a hazardous solvent, make sure to connect a tube to the exhaust and let the gas discharge safely away from the room.
6. Power Inlet	Connects the power plug to Gastorr.
7. Fuse Box	Contains two fuses.
8. Ground Connector	Connects Gastorr with a grounding wire.

6. How to Install

6-1: Unpacking

Upon opening, remove Gastorr and the accessory package from the packing material and compare each item with the list of accessories on page 3.

6-2: Connecting to the power supply

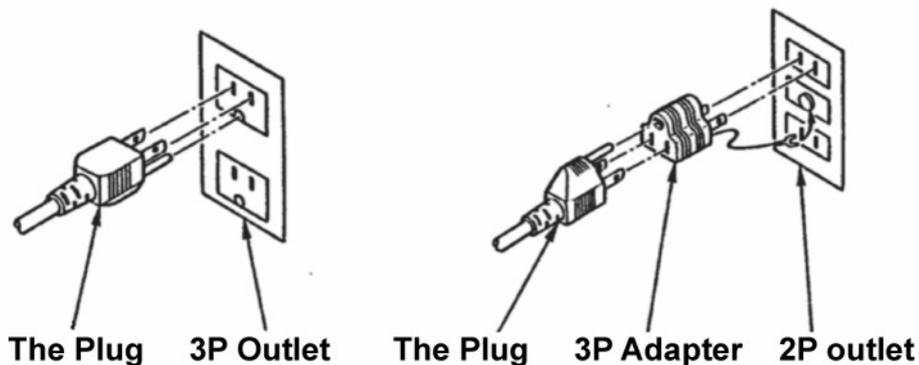


WARNING! Hold the plug firmly when connecting to the power outlet. Keep the plug dry to prevent electric shock.



CAUTION! If the power outlet is plugged with other high power electric devices, obtain another power source for the GASTORR 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.

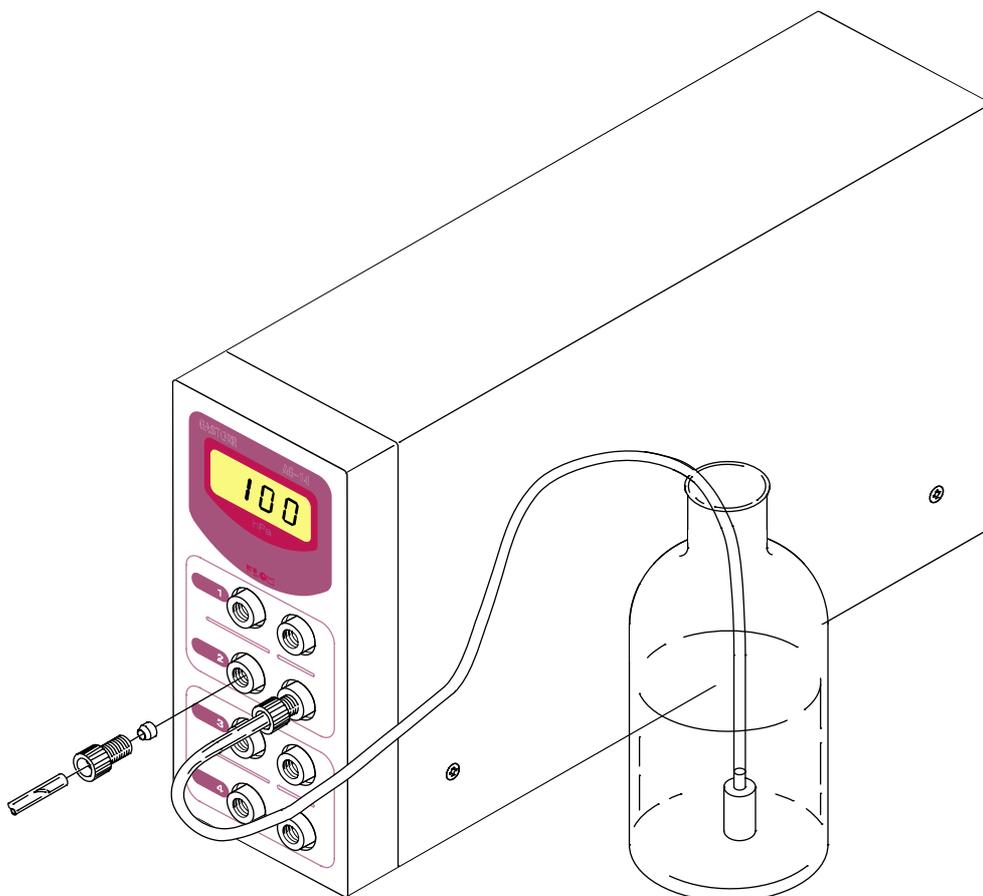


6-3: Tubing

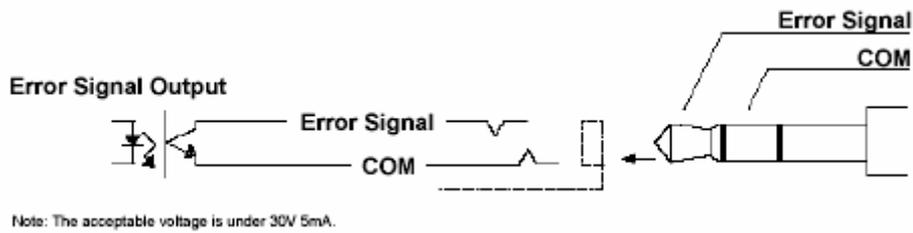


Gastorr is designed to degas the mobile phase before it enters the pressure pump. Place the unit between the solvent container and the pressure pump for proper tubing. Do not connect Gastorr to the pressure pump outlet. High pressure may seriously damage the degassing membranes inside the chambers.

1. Turn on the main power switch located on the rear panel.
2. Connect the tube from the solvent bottle to the chamber of your choice. Connect the syringe connector and use a syringe to fill the degassing tube inside the chamber. Once filled, then replace the syringe connector with another tube leading to an LC pump.
3. Now the setup is complete. Make sure that the vacuum level shown on the LCD display is between 100 and 105hPa.



7. Error Signals



7-1: About error signals

Gastorr 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 is described as follows:

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

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

Er 3.....This error 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 Gastorr



- Do not pour or splash any liquid on Gastorr. If the solvent is splashed on any part of Gastorr 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 Gastorr has dried out completely, or it may cause fire, electrocution, or malfunction of Gastorr. If the solvent has seeped inside Gastorr, please contact FLOM 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 Gastorr.
- When you move Gastorr, 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 Gastorr 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 GASTORR AND ATTEMPT TO FIX OR MODIFY IT YOURSELF!** If you desire to modify Gastorr, or to fix Gastorr that is malfunctioning, contact FLOM Corporation and let our qualified engineers repair Gastorr or make necessary changes. Under no circumstance remove the metal casing. Any malfunctions caused by modifications by any person other than authorized FLOM engineers will not be covered by the warranty. FLOM Corporation takes no responsibility for any personal injuries or mechanical damages caused by unauthorized modifications.



- Do not use Gastorr in an outdoor environment.
- Do not put Gastorr in the abnormal position (such as laying on its side or standing on its rear panel). Gastorr may malfunction if not used in a proper position.
- Keep Gastorr away from corrosive gases.
- Do not place Gastorr nearby high-voltage electronic devices. It may degrade the performance of CPU board inside.
- Do not place Gastorr in direct sunlight.
- Do not operate Gastorr in the environment where temperature fluctuates rapidly. The room temperature should be within the range of 10C and 40C.
- The acceptable voltage for Gastorr 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 FLOM 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 Gastorr nearby any heat sources. It may damage Gastorr 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 FLOM 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 Gastorr 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 / Optional Parts

Product Serial No.	Product Name	Quantity
0005	Suction syringe	1
9711	Flat seal fitting (1/4-28UNF)	10
9701	3.0mm flat-seal ferrule	10
7104	3.0mm x 2mm PFA tube	10m
9721	1/16" flat seal fitting (1/4-28UNF)	10
9703	1/16" flat seal ferrule	10

- When you place an order, make sure to include both the product name and the serial number on the order sheet.
- FLOM 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 your local distributor or FLOM 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 FLOM Corporation immediately for assistance.

11. Warranty Information

FLOM Statement of Limited Warranty

All of us at FLOM Corporation thank you for purchasing FLOM Gastorr AG model. We provide a 1-year warranty, and it is subject to the following limitations:

1. This warranty herein applies only to FLOM Gastorr AG model and its accessories packaged by FLOM Corporation and its authorized manufacturers.
2. The liability of FLOM Corporation shall be limited to:
 - a. Replacement of the defective Gastorr and/or its accessories listed on the List of Accessories.
 - b. The cost of repairing the defective Gastorr 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 Gastorr according to the safety precautions and instructions explained in the instruction manual.
 - b. The user operated Gastorr with another equipment that was defective.
 - c. Gastorr was mechanically modified without a written authorization from FLOM 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 FLOM 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 FLOM Corporation that he/she claimed defective.

This warranty is written solely by FLOM 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 FLOM Corporation at the address below:

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