



LC-26A

August, 1995

MF-9089

INSTRUCTION MANUAL

Vacuum Degasser

Bioanalytical
Systems, Inc
2701 Kent Avenue
West Lafayette
Indiana 47906

MANUFACTURER'S NOTE

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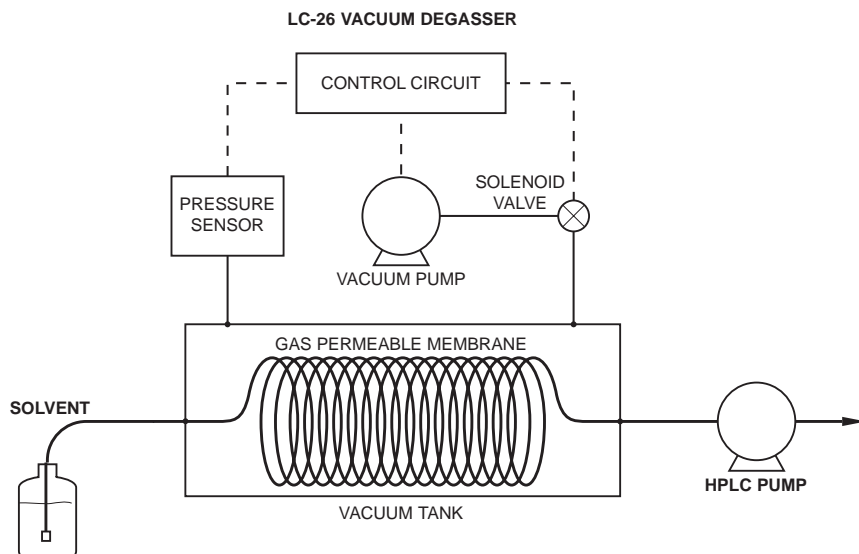
Section 1. PREFACE

This manual explains the installation and operation of the LC-26A Degasser. Please read the entire manual prior to installation and startup.

The LC-26A Degasser is a rugged on-line degasser which will remove dissolved gasses from up to three separate lines (channels) of mobile phase. It is an invaluable accessory for ternary gradient liquid chromatography, or for any application where a gas-free flowing solvent is required. An on-line degasser is much more convenient and effective than other common degassing techniques, such as helium sparging, ultrasonication, filtration, heating and vacuum degassing.

The heart of the LC-26A degasser is a tubular plastic membrane which is permeable to the small molecules of atmospheric gasses but impermeable to liquid. The solution flows through this tube, which is located within a vacuum chamber. Dissolved gasses pass from the solution through the membrane in response to the lower pressure in the vacuum chamber. The membrane is impermeable to the gaseous phase of common solvents, so no change in solvent composition occurs.

Figure 1.1. Principle of LC-26A operation.



Section 2. SUPPORT POLICY

2.1 USER UPDATES

To activate your warranty, and receive product update information news and valuable information, fill out and return the Warranty Enrollment Card which was shipped with the instrument. We would like to know who you are and what you do, so we can send you appropriate information about BAS chromatographic and electrochemical products.

2.2 DAMAGED SHIPMENTS

Breakage of any part of this instrument during shipping should be reported immediately to BAS Customer Service. You must retain the original packing box and contents for inspection by the freight handler. BAS will replace any new instrument damaged in shipping with an identical product as soon as possible after the claim filing date. Claims not filed within 30 days after the shipping date will be invalid.

2.3 PRODUCT WARRANTY

Bioanalytical Systems, Inc. products are fully warranted against defects in material and workmanship. The LC-26A Degasser is unconditionally warranted for 90 days from the date of shipment, except when failure is due to obvious abuse or neglect, unauthorized tampering, procedures not described in manuals, or improper connection of components. The following items are not covered under any warranty: lamps, panel lights, fuses, pump seals and valve seals.

For any product expressly covered under this warranty, Bioanalytical Systems is liable only to the extent of replacement of defective items. Bioanalytical Systems, Inc. shall not be liable for any personal injury, property damage, or consequential damages of any kind whatsoever. The foregoing warranty is in lieu of all other warranties of merchantability and fitness for a particular purpose.

2.4 SERVICE

Bioanalytical Systems provides a skilled service staff available for consultation if an equipment-oriented problem should arise. For further details, call customer service personnel (317 463-4527). Following discussion of your specific difficulties, an appropriate course of action will be described and the problem resolved accordingly. Do not return any products for service until a Return Authorization Number (RA#) has been obtained. The RA# identifies you as the sender and describes to us the problem you are having in full detail. Turnaround time on service can be quoted to you at the time your RA# is issued, although we cannot determine the actual amount of service required until we have received your unit and diagnosed the problem. All correspondence and shipments should be sent to:

RA#_____, Service Department
Bioanalytical Systems, Inc.
2701 Kent Avenue
West Lafayette, IN 47906

Section 3. INSTALLATION

3.1 UNPACKING

Please retain the shipping box and packing material until the unit has been fully tested. The shipping materials will be needed if you discover damage incurred during shipping.

The shipping box contains the following items:

1. LC-26A Degasser
2. This manual
3. Power cord
4. 6 flangeless nuts for 1/8" tubing (MR-5042)
5. 6 flangeless ferrules for 1/8" tubing (MR-5403)
6. FEP Teflon® tubing, 1/8" (MR-5002)

3.2 IDENTIFICATION OF PARTS

Figures 3.1 and 3.2 show front and back views of the L.C.-26A Degasser, with all parts labeled.

Figure 3.1. Front view of LC-26A Degasser.

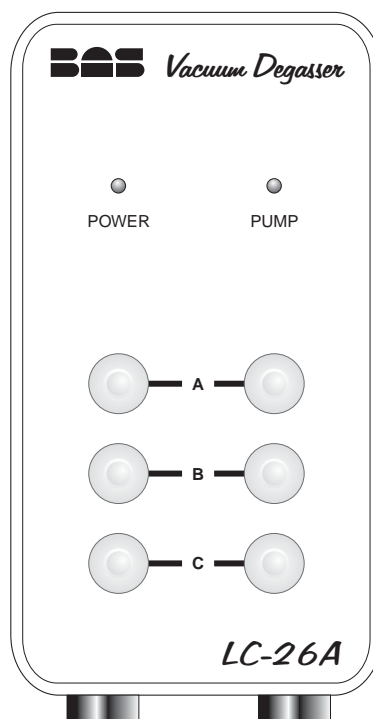
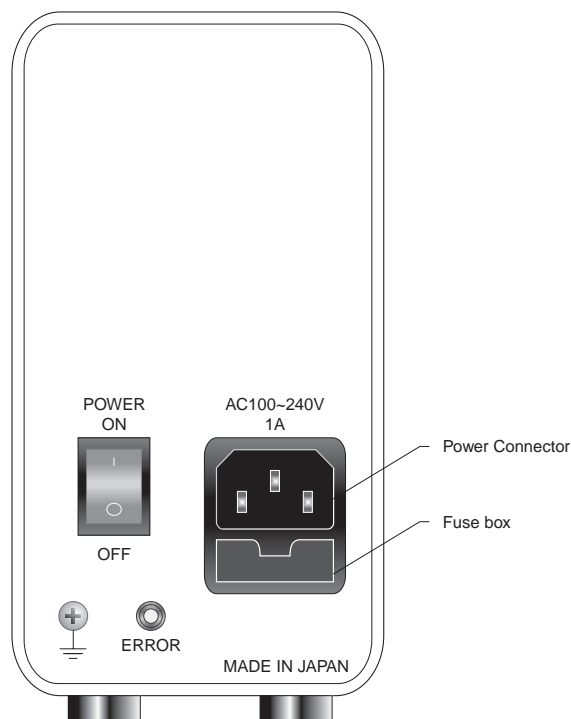


Figure 3.2. Rear view of LC-26A Degasser. The error connector is for factory diagnostics.

3.3 SITING THE LC-26A DEGASSER

For best results, the degasser should be placed near your pump. The mobile-phase lines going from the degasser to the pump should be as short as possible (about 2 feet). Since Teflon tubing is permeable to gasses, air might re-enter if these lines are excessively long.

The tubing from the reservoirs to the degasser is not under this restriction, since the mobile phase in them has not yet been degassed. If possible, elevate the solvent reservoirs above the level of the degasser. This will provide hydrostatic pressure that will aid in purging the degasser and connecting tubing. Do not place the reservoirs atop the degasser, as it vibrates during operation.

3.4 POWER REQUIREMENTS

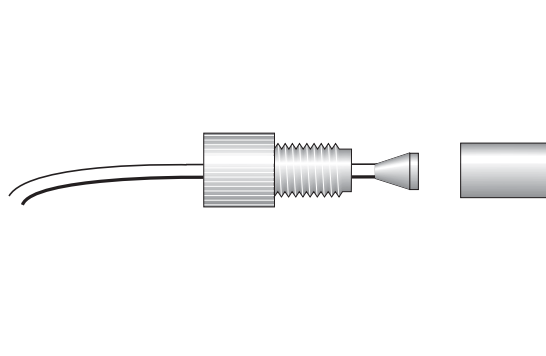
Power is provided to the LC-26A Degasser via a 3-pronged power cord that attaches at the back of the instrument. The degasser can be operated at 100-260 VAC, 50-60 Hz. No voltage adjustments are necessary.

3.5 FLUID CONNECTIONS

NOTE: The LC-26A Degasser removes only dissolved gases from fluids. Particulates will either hang up inside the degasser, or pass through and cause trouble in the chromatograph. Therefore, ALL FLUIDS MUST BE FILTERED THROUGH A 0.2 μm MEMBRANE FILTER before being placed in the solvent reservoirs. We recommend the BAS Mobile Phase Filtration Unit (MF-6126).

1. Cut the 1/8" tubing to the appropriate lengths for the inlet and outlet lines to the degasser. The inlet lines should have solvent filters (MR-4137) at the reservoir ends, which will both filter the liquid and keep the tubing submerged in the reservoirs.
2. Attach the tubing to the LC-26A using the flangeless fittings provided. Note that the ferrules attach in what appears to be a reversed orientation (fig. 3.3). **IMPORTANT: NEVER USE METAL NUTS AND FERRULES TO ATTACH TUBING TO THE LC-26A (the PEEK fittings on the degasser will crack).**

Figure 3.3. Attachment of flangeless connectors.



3. Purge each mobile-phase line by aspirating at the pump end with a syringe. There is a dead volume of 8 mL within the degasser; but don't be surprised if you have to aspirate 10-20 mL of air before liquid flows to the pump. Keep this large dead volume in mind when changing solvents; it's a good idea to purge the pump for 5 minutes per channel at 5 mL/min to bring fresh mobile phase up to the chromatograph.

Section 4. OPERATION

4.1 STARTUP

1. Prepare fresh, filtered 40% acetonitrile in deionized water, and place in clean reservoirs.
2. Elevate the reservoirs to provide hydrostatic pressure to the degasser, and insert the inlet lines into the reservoirs.
3. If there is air in the degasser, purge it by aspirating with a syringe at the pump inlet or pump prime/purge valve.
4. Purge the degasser and tubing by pumping at least 25 mL per channel at 5 mL/min.
5. Switch to fresh, filtered mobile phase in clean reservoirs. Pump another 25 mL per channel.
6. Start the degasser by turning on the power switch. The main power light will come on. Once a sufficient vacuum is achieved, the monitor light will come on, indicating that degassing is complete.
7. Operate the chromatograph in the usual manner. The degasser vacuum pump will cycle on and off as needed to maintain a flow of degassed mobile phase.

4.2 ROUTINE OPERATION

The degasser is automatic and requires a minimum of attention during operation. The vacuum pump will cycle on and off as needed to maintain degassing. The monitor light should stay on, although it may turn off briefly when the vacuum pump turns on. If the monitor light stays off, the vacuum is not being maintained, and the unit needs servicing.

4.3 SHUTDOWN

The unit should never be turned off (except temporarily) with mobile-phase buffers in the flowstream. To take the unit out of service, do the following:

1. Replace the mobile phases with deionized water.
2. Pump 25 mL deionized water through each active channel, at a flow rate not to exceed 5 mL/min.
3. Pump 25-50 mL neat methanol through each active channel.
4. Remove the inlet and outlet lines to the degasser, and let all the excess methanol run out.
5. After the unit has dried in air, cap the inlet and outlet lines.

Section 5. TROUBLESHOOTING

5.1 Power light does not come on

1. Check power cord connection.
2. Open fuse holder and check for burned fuse.
3. Call BAS at (317) 463-4527.

5.2 Air bubbles in outlet tubes

1. During purge.
 - A. Aspiration rate is too fast. Don't purge at more than 5 mL/min.
 - B. Leaks at outlet tube connection to degasser. Tighten or replace these fittings.
2. During routine operation.
 - A. Pump flow rate is too fast. Don't pump at greater than 5 mL/min.
 - B. Leaks at outlet tube connection to degasser. Tighten or replace these fittings.
 - C. Clogs at solvent-reservoir filters. Clean or replace. (Test by removing filters temporarily.)
 - D. Solvent reservoir is too low. Elevate it.

5.3 No flow

1. Air in pump. Purge pump. Remove inlet line from pump and aspirate with syringe (or elevate mobile-phase reservoir) to make sure that there is flow to pump.
2. Clog somewhere in flow stream before pump. Remove and test each component, starting from solvent filters. Elevate solvent reservoirs.

Section 6. SPARE PARTS

ITEM	PART NUMBER
Manual	MF-9089
Power cord	ER-8502
Flangeless nut, 1/8"	MR-5402
Flangeless ferrule, 1/8"	MR-5403
FEP tubing, 1/8" x 20'	MR-5002

Section 7. SPECIFICATIONS

Degassing capacity	Output fluid has 0.5 ppm dissolved gas at 1 mL/min flow and 25°C.
Maximum flow	8.5 mL/min
Inner volume	8 mL per channel
Number of channels	3
Maximum pressure	45 Torr
Materials in flow stream	PEEK and synthetic resin (degassing membrane)
Self cleaning	Switching solenoid vents fresh air to vacuum pump
Overheat protection	Unit will shut off
Power requirements	100-260 VAC 50/60 Hz, automatic
Ambient temperature range	10-40°C
Ambient humidity range	40-85%
Dimensions (cm)	8.0 (w) x 14.5 (h) x 28.5 (l)
Weight (kg)	3.1