

VACUUM DEGASSERS FOR LIQUID CHROMATOGRAPHY



Gases, such as atmospheric Oxygen and Nitrogen, become dissolved in solvents used in High Pressure Liquid Chromatography. It is essential that these are removed, otherwise both the chromatography and the pump and system performance will be adversely affected.

When solvents are mixed for HPLC, any dissolved gases become displaced, leading to bubble formation, which affects pump performance. In addition, the presence of dissolved oxygen in the solvents reduces overall system sensitivity by increasing the noise and baseline levels in UV detectors.

HELIUM DEGASSING

One method of degassing involves bubbling Helium through the solvents prior to use. Although this procedure achieves the required degassing, it suffers from a number of drawbacks;

- Cost – Helium is Expensive
- Time - Cylinders need to be repeatedly monitored for remaining content
- Effort – the repeated Purchasing, Goods-in Receipt and related Invoice Payment takes considerable Logistical effort
- Risk – Suppliers can let you down and Staff can forget to turn off gas flows
- Environmental Pollution – Solvents can be released into the atmosphere (see **TOXIC SUBSTANCES – ACCEPTABLE EXPOSURE LIMITS** overleaf)

VACUUM DEGASSING

A vacuum degasser uses only electrical power and can degas up to four solvent lines.

Gases are removed by passing the solvent through a permeable membrane, on the outside of which is a vacuum. As the solvent passes, dissolved gases diffuse through the membrane into the vacuum chamber and are removed. The membrane porosity ensures that only the unwanted gases pass through, no solvent vapours enter the laboratory. In addition, when mixed solvents are used, there is no depletion of the more volatile component.

Wetted components are PTFE or similarly inert compounds, suitable for all HPLC applications. Dead volumes are negligible, compatible with the required degassing quality and flowrates. When a four-channel system is used, the parameters of degassing quality and available flow rate can be varied, by piping the various channels in parallel or in series.



TOXIC SUBSTANCES – ACCEPTABLE EXPOSURE LIMITS

In the UK, the COSHH (Control of Substances Hazardous to Health) regulations, administered by the Health and Safety Executive, place a duty on employers to protect employees from exposure to toxic chemicals. In terms of chemical vapours, dusts and fumes present in the workplace, permissible concentration limits of these substances in air are laid down in the regulations and quoted as either the Maximum Exposure Limit (MEL) or the Occupational Exposure Standard (OES).

An MEL is defined as the maximum concentration of an airborne substance, averaged over a reference period, to which employees may be exposed. If a substance has been assigned an MEL, exposure must be strictly controlled and it is usually necessary to carry out a full COSHH assessment to demonstrate that controls are adequate. Two solvents used in HPLC which have been assigned MEL's are

- Dichloromethane
- 2-Methoxyethanol

An OES is the concentration of an airborne substance, averaged over a reference period, at which, according to current knowledge, there is no evidence that it is likely to be injurious to employees if they are exposed to inhalation, day after day. It is thus less significant than an MEL, but the employer may still have to demonstrate that adequate precautions are being taken to avoid a situation where the OES is exceeded.

HOW TO ORDER

Part Number	Description
CSI 6150/1	Single Channel Degasser
CSI 6150/2	Dual Channel Degasser
CSI 6150/4	Four Channel Degasser

Each Degasser comes complete with PTFE connection tubing, finger-tight nuts and PTFE ferrules.

SPECIFICATIONS

Flow Rate Range:	0.2 to 5 ml/min per channel
Gas Removal:	Better than 1ppm at 1 ml/min
Vacuum Source:	Vacuum Pump with Silencer
Vacuum Chamber:	Single Vacuum Chamber with one, two, or four Degassing Lines
Vacuum Sensor:	Automatically engages Pump when required
Dimensions:	12cm(W) x 26cm(D) x 22cm(H)
Weight:	8 kilos, 17.5lbs
Power:	220VA at 230V

Cambridge Scientific Instruments is constantly seeking to improve its products and services and therefore reserves the right to amend specifications as a consequence.



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