Why Is Degassing Required and How Does It Work?

LIQUID CHROMATOGRAPHY: All liquids contain dissolved gases which are readily absorbed from the air. In solvents for liquid chromatography, dissolved gases reduce pump flow rate stability, detector baseline stability, and increase detector noise. In low pressure gradient formation, dissolved air often outgases, causing malfunctions of the pump and associated valves. High precision constant-pressure pumping is very difficult to achieve with liquids rich in dissolved gases.

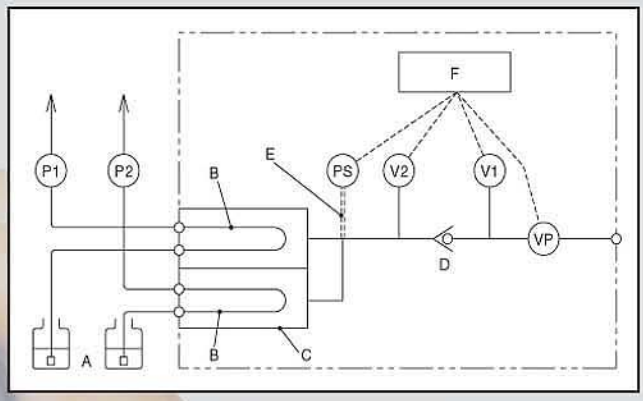
Additionally, as sample volumes continue to decrease, and detection sensitivities continue to increase, the gas components present in liquid eluents and samples have become recognized as a factor influencing analytical results. Dissolved gases affect refractive index, fluorescence, electrochemical, and ultraviolet detectors, producing spurious analytical results.

PRECISION ANALYZERS: In precision analyzers which require precise control of fluid flow rates, such as clinical diagnostic analyzers, dissolved gases in reagents, water, and other liquids reduce the accuracy and precision of the analyzer. Typically, the performance of the pump cannot be optimized unless the fluids being pumped are thoroughly degassed.

HOW DEGASSING WORKS: The degassing unit is conventionally placed in-line between the solvent reservoir and the inlet of the pump. The action of the pump draws the liquid from the reservoir through the degassing unit. Solvent is drawn through the specially formulated fluororesin membranous tubing.

The fluororesin tubing is permeable to the small dissolved gases; hence, gases will permeate out by vacuum through the tubing. The solvent will be thoroughly degassed when it has reached the exit(s) of the degassing unit, and then will enter the pump.

Generally, the efficiency of the degassing is directly related to the internal surfaces of fluororesin tubing encased in the independent vacuum chambers and inversely related to the liquid flow rate.



(P1) (P2): PUMPS (PS): PRESSURE SENSOR
(V1) (V2): SOLENOID VALVES (VP): VACUUM PUMP
A: SOLVENT B: DEGASSING TUBE
C: INDEPENDENT VACUUM CHAMBERS
D: VALVE E: PENETRATION MEMBRANOUS TUBE
F: CONTROLLER

- The membranous tubes are encased in INDEPENDENT VACUUM CHAMBERS to avoid mutual interference.
- SOLENOID VALVE 1 will alternatively exhaust gases in VACUUM CHAMBERS and take in the atmosphere, thereby keeping VACUUM PUMP clean. This function of SOLENOID VALVE 1 will prevent VACUUM PUMP from deteriorating its degassing speeds as well as the service life.
- SOLENOID VALVE 2 will open VACUUM CHAMBERS when POWER SWITCH is turned off, thereby helping minimize the changes in the mixed ratio of solvents.
- PENETRATION MEMBRANOUS TUBE, providing air-curtain by air penetration, will prevent PRESSURE SENSOR from deteriorating, and at the same time maintains the service life of VACUUM PUMP by exhausting the gas inside VACUUM CHAMBERS after the gas is diluted with air entering through PENETRATION MEMBRANOUS TUBE
- The mechanisms contained in the degassing instruments, *Degasys, Degasys Populaire and Degasys Ultimate* are patented in the U.S.A., Germany, and Japan.
- The specifications are subject to change without a prior notice for improvement.

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