

Since the solar neutrino flux is very low, it is necessary to use as large a volume of tetrachloroethylene as is technically feasible, and to perform the counting measurements in a miniature counter with a very low background counting rate. It is important to have a sealed system to prevent the inleakage of air argon, since it would dilute the final sample that is counted. To insure that the tank and liquid pumping system was absolutely tight, a helium leak test was performed. For this test the entire system was evacuated, the outside of the system was blanketed with helium gas, and a search for helium leaking into the system was made with a mass spectrometer attached to the vacuum pumping system. The total helium leakage rate was less than  $10^{-6} \text{ cm}^3 \text{ sec}^{-1}$  under these conditions. This test demonstrated that the inleakage of air argon into the system during the long exposures (100 days) would be small. Following this test the tank was filled with tetrachloroethylene.

The detector employs  $3.8 \times 10^5$  liters of tetrachloroethylene that was contained in a horizontal cylindrical tank 6.2 meters in diameter and 14.8 meters long. The  $\text{Ar}^{37}$  formed in the liquid by neutrino capture is removed by purging the liquid with helium gas. To provide the gas and liquid circulation a system of pumps and eductors are used, see Figure 1.

Liquid is pumped from the bottom of the tank, and returned through two header pipes that run longitudinally through the center of the tank. On each of these header pipes is attached a set of 20 equally spaced eductor (aspirator) nozzles that draw helium from the top of the tank and mix it with the liquid as fine bubbles. This system of pumps and eductors aspirates the helium blanket gas (volume 20,000 liters) through the liquid at a total rate of 9000 liters per minute. The combined agitation and bubbling action produces turbulent mixing of helium gas throughout the entire volume of the liquid. This provides an effective purging action to bring argon dissolved