Initial attempts were made to control glitching and deposition by introducing ~0.5 sccm of H_2 as a co-gas. The expectation was that the hydrogen would lead to the formation of gaseous products that would be pumped away, according to the reactions of the type:

$$2AlI_3 + 3H_2 \quad 2Al + 6HI$$

While glitching and deposition was somewhat improved it was still not production-worthy; although the arc chamber itself was cleaner, deposition on the extraction electrodes led to instabilities and the source body showed deposition also.

In response, a gas distribution system external to the arc chamber was added to the ion source in the form of a 1/8" diameter stainless steel tube positioned around the source body just below the height of the arc chamber. This tube has a series of holes along its length, half of them pointing towards the extraction region, and the other half aiming backwards towards the bushing isolating the energized source. A gas line

Fig. 4. Hydrogen generator installed in implanter gas box

The generator system contains a small, pressurized ballast tank to smooth gas delivery. The volume and pressure of the gas contained in the ballast (<0.5 liter, <100 psig) are low enough that even in the event of an instantaneous release of the entire contents, the exhaust air flow through the gas box will prevent the concentration of hydrogen reaching the 4% Lower Explosive Limit (LEL) [5].

VI. Conclusions