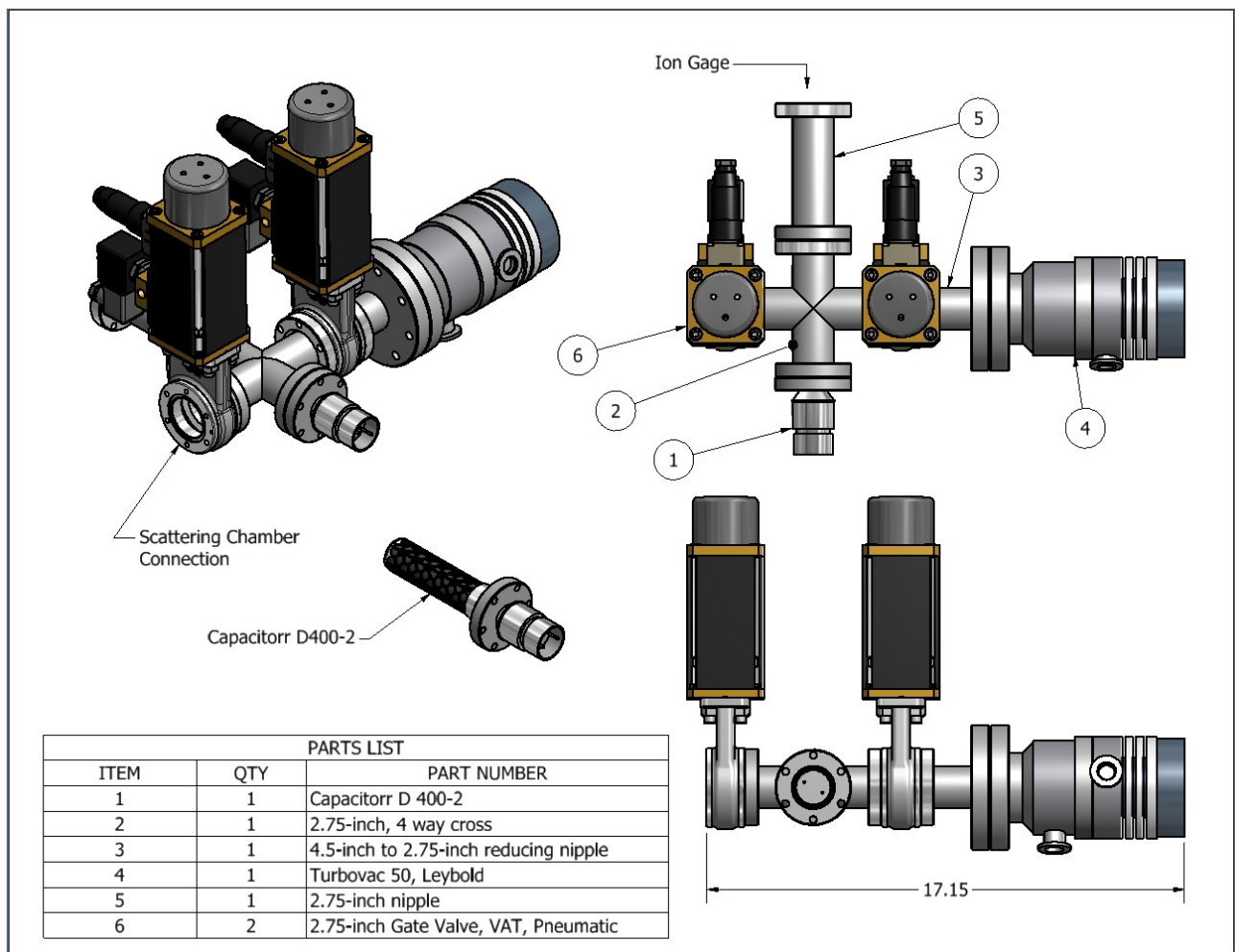


Hydrogen Getter System for the JLab Tritium Target

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A hydrogen getter system was recommended by the June 3, 2010 JLab Review Committee: "A U getter bed should be attached to the scattering chamber." (action item:32). The tritium target will contain less than 0.4 L of tritium gas at STP. In the event of a leak or other inadvertent release of tritium it will be necessary to incorporate a getter system which will absorb the tritium and prevent contamination. The solution here makes use of a commercially available non-evaporable getter (NEG) pump. Once the tritium is absorbed, the getter system may be isolated and the tritium recovered at a later date. The amount of tritium in the target (0.4 L STP) is equivalent to 307 torr-liters. A standard getter pump from SAES (the Capacitorr D400-2), with a pumping speed of 400-l/s and sorption capacity of 900 torr-liter for H₂, is suitable for this application. This pump will be connected to the scattering chamber via a normally closed pneumatic gate valve. The complete system, minus the roughing pump, is shown in the following figure:



The gate valve at the scattering chamber will be normally closed. If the RGA on the scattering chamber (action item #31) detects tritium then a signal will be sent to open this gate valve and all of the tritium

will be absorbed in the getter material. The gate valve may then be closed and the tritium can be recovered at a later date. The second gate valve is used to isolate the pumping system from the getter pump. During activation of the getter material this valve will be opened and the vacuum pumps will be running. After activation is complete this valve may be closed and the pumps turned off. This second valve and the pumps can be operated remotely. Once the getter is activated and both valves are closed the system may remain in this configuration indefinitely. This system was purchased already by the ANL group.

The hardware requirements and approximate cost of such a system is as follows:

2.75" 4-way cross	\$110.00
2.75" Nipple	\$56.00
2.75" Pneumatic Gate Valves (2) VAT	\$4700.00
50-l/s TPM System (pump and controller)	\$3874.00
Roughing Pump (Edwards XDS-10)	\$4500.00
Ion gage/controller	\$2000.00
Getter Pump (SAES Capacitorr D400-2)	\$4672.00
Getter Controller (SAES CF35)	\$1500.00
TOTAL COST	\$21412.00