

DCS chopper pumping station

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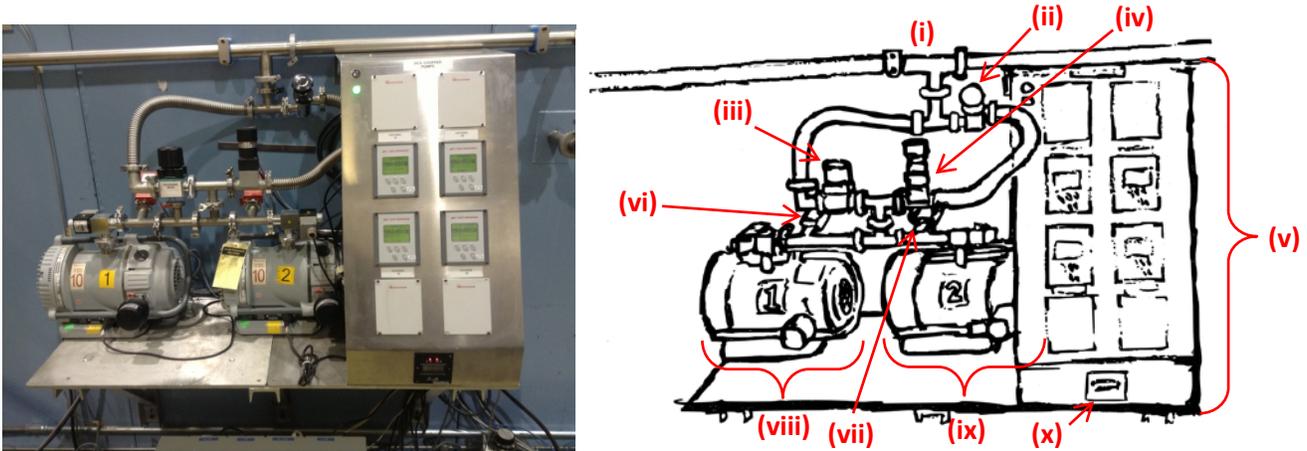


Figure 1. DCS chopper housing pumping station. The pumping station for the chopper housings consists of (i) plumbing to connect to the housing turbo molecular pumps, (ii) a manual lift-off valve for the primary pumping line, (iii) a manual lift-off valve for the rough pumping line, (iv) an automatic valve that closes in the event of a system failure, (v) a panel of Edwards TIC's (turbo instrument controllers), (vi) a Pirani gauge for rough pump 1, (vii) a Pirani gauge for rough pump 2, (viii) rough pump 1, (ix) rough pump 2, and (x) a thermocouple vacuum gauge.



Figure 2. Detail of TIC panel. (a) The TIC for each housing's turbo molecule pump is numbered counter-clockwise starting at the top left. (b) A close-up of the TIC for housing 1 shows standard conditions. Housings 1, 2, and 3 should have APGX approximately 8×10^{-5} Torr, while housing 4 has an updated vacuum gauge that shows a more accurate pressure near 3×10^{-4} Torr; these gauges are mounted on ports of the housings opposite to the pumping ports. Housings 1 and 2 should show APGL near 2×10^{-1} Torr, from the rough pump Pirani gauges, while housings 3 and 4 are not connected to a roughing gauge, but rather controlled off of housing 1.

Additional notes: The two manual valves are only different because that was the available equipment. Conductance in this configuration is mostly limited by the valves (a roughing gate valve instead of a lift-off valve would decrease initial pumping time). The rough pump 2 is actuated by a relay box, so the switch of the pump should remain on even while the pump is "off." Each rough pump has an hour-meter on the back. If the pressure of the system goes above ??? Torr, the automatic valve will close and the system will isolate. The housing 4 gauge was replaced due to failure induced by an oil-lubricated roughing pump plating the gauge innards. There is a chopper between the pumping port and the vacuum gauge.

In the event that the system is completely vented:

- 1) The primary manual valve (fig. 1-ii) and the roughing valve (fig. 1-iii) should be opened
- 2) Ensure that all TIC displays show the main menu (fig. 2-b) and the appropriate gauges read
- 3) Initiate a pumping cycle by pressing the physical "cycle on/off" button on the TIC for housing 1
- 4) At this time either roughing pump 1 (fig. 1-viii) or roughing pump 2 (fig. 1-ix) will turn on
- 5) When the appropriate Pirani gauge reads a pressure less than 7×10^{-1} Torr, the turbo molecular pumping cycle will begin
- 6) Before starting the choppers, the roughing valve must be closed to return the system to a protected mode (via the automatic valve in fig. 1-iv)
- 7) When the APGX reading on every housing is less than 1×10^{-3} Torr, the choppers may be started
- 8) It may take as long as a day to reach housing pressures less than 1×10^{-4} Torr