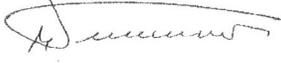
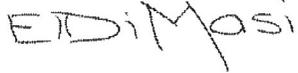


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Title: Bleed up and evacuation of the NSLS-II SMI Vacuum WAXS chamber	

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1 WORK SCOPE

This work instruction provides instructions for the bleed up and evacuation of the NSLS-II SMI vacuum WAXS chamber inside the 12-ID-C hutch.

This work instruction will enable Authorized Beamline Staff to safely perform configuration changes requiring bleed up and evacuation of the vacuum WAXS chamber.

2 PREREQUISITES

- 2.1 Only Authorized Personnel shall perform this work.
- 2.2 Authorized Personnel obtain the following equipment and have all available while performing this work:
 - Turbo pump cart
 - Dry N₂ bottle on the cart
 - Yellow Caution Tags

3 HOLD POINTS

If there are any known hold points during the execution of the work, list them here (i.e., any steps that require specific approval prior to performance).

4 PRECAUTIONS/WARNINGS

- 4.1 Do not leave gas venting operations unattended.

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- 4.2 During venting or evacuation of the WAXS vacuum chamber ensure that the PULATUS 300KW detector located inside the chamber is shut off in order to avoid the damage of the detector when the pressure reaches 10^{-1} - 10^{-2} Torr

5 INSTRUCTIONS

Note: Vacuum layout is illustrated in Attachment A, *Vacuum layout Drawing*.

Note: During venting or evacuation of the WAXS vacuum chamber ensure that the PULATUS 300KW detector located inside the chamber is shut off in order to avoid the damage of the detector when the pressure reaches 10^{-1} - 10^{-2} Torr. *Refer to the "SMI detector manual"*.

5.1 Venting of the WAXS vacuum chamber

- 5.1.1 Record the vacuum pressure in Vacuum Section 2:VacSec-3, 2:VacSec-4, and 2:VacSec-5 by recording the vacuum levels from the following cold cathode gauges in the Beamline Logbook:
- 2:CCath-4
 - 2:CCath-5
 - 2:CCath-6
 - 2:CCath-7
- 5.1.2 Close the following gate valves:
- 2:GV-4
 - 2:GV-5
- 5.1.3 Shut off high voltage to the 2:IP-5 ion pump using EPS Vacuum Screen (Figure 5.1)

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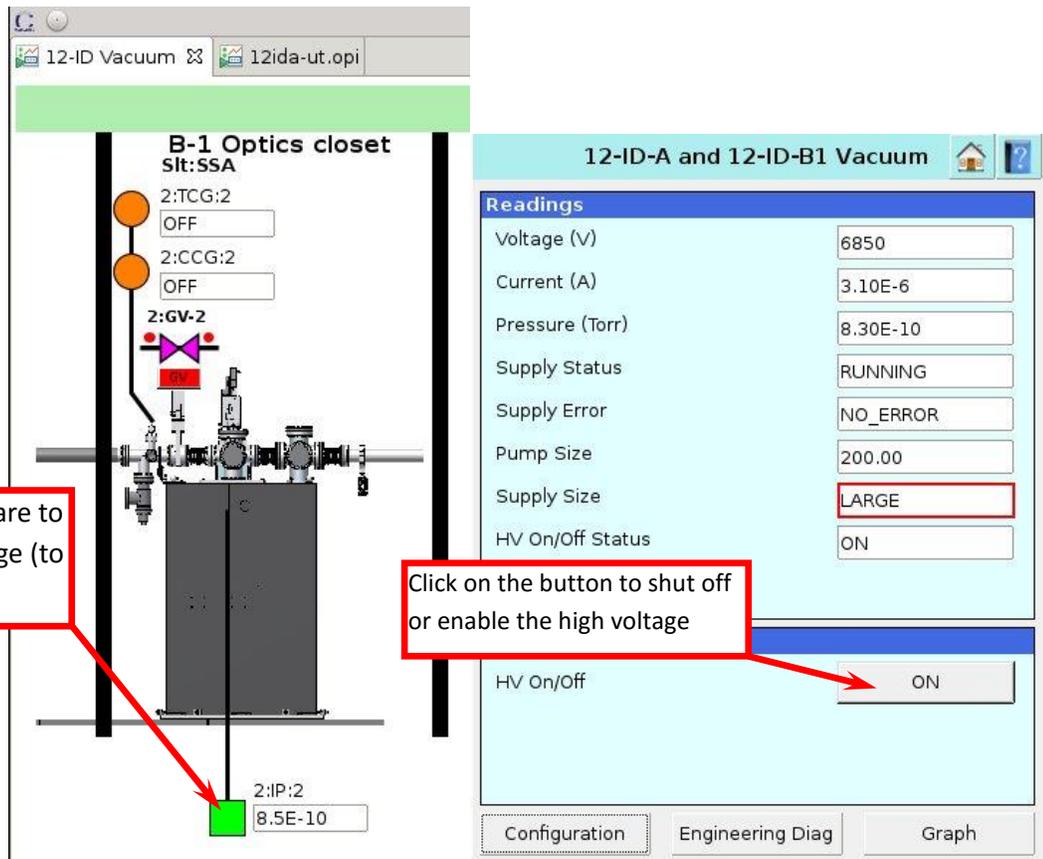


Figure 5-1: Typical EPS Vacuum Screen Detail

5.1.4 Record the vacuum pressure from the following cold cathode gauges in the Beamline Logbook:

- 2:CCath-4
- 2:CCath-5

5.1.5 Disconnect the Solenoid Connector from Gate Valve 2:GV-5, shown in Figure 5-2 below

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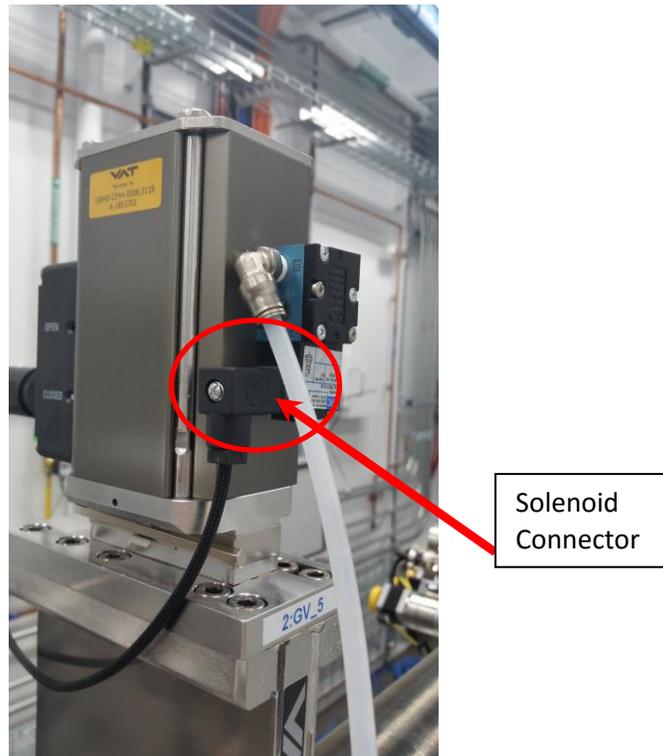


Figure 5-2: Gate Valve 2:GV-5 Solenoid Connector

- 5.1.6 Attach a yellow Caution Tag to the cable at the connector, in accordance with PS-C-PRC-AO-001, *Caution ("Yellow") Tags*.
- 5.1.7 Shut off the WAXS turbo pump and close the Processed Chilled Water WAXS Supply Valve and Processed Chilled Water WAXS Return Valve
- 5.1.8 Close 2:IV-WAXS valve between WAXS vacuum chamber and WAXS Turbo Pump.

Note: Before venting, release Destaco clamps on the WAXS chamber fast access door to avoid overpressurization of the chamber and trapping of the dry N₂ inside the WAXS chamber components.

- 5.1.9 Connect a turbo pump cart to the pump-out port on WAXS Vacuum chamber's downstream side (2:VacSec-5 vacuum section).

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5.1.10 Vent Vacuum Section 2:VacSec-5 in accordance with PS-C-XFD-PRC-001, *NSLS-II Beamline Vacuum System Venting Procedure* using a gas manifold vent assembly attached to a turbocart.

5.1.11 Record the vacuum pressure in Vacuum Section 2:VacSec-4 in the Beamline Logbook.

5.2 Evacuation of the WAXS vacuum chamber

5.2.1 Close Gate Valve 2:GV-3 and Gate Valve 2:GV-4.

5.2.2 Record the vacuum pressure in Vacuum Section 2:VacSec-3 and 2:VacSec-4 in the Beamline Logbook.

5.2.3 Close the WAXS chamber fast access door and close all Destaco clamps.

5.2.4 Check that the manual isolation valve is closed on the downstream side of the WAXS vacuum chamber

5.2.5 Open the Gate Valve 2:IV-WAXS

5.2.6 Open the Processed Chilled Water WAXS Supply Valve and Processed Chilled Water WAXS Return Valve

5.2.7 Start the WAXS turbo pump

5.2.8 Connect a turbo pump cart to the pump-out port on Vacuum Section 2:VacSec-5 immediately downstream of the Gate Valve 2:GV-5

5.2.9 Open the pump-out valve AND pump down the upstream section (upstream of the C Hutch Slit 2:Slit-C, refer to the Attachment A, *Vacuum layout Drawing*) of the Vacuum Section 2:VacSec-5 using the turbo pump cart.

5.2.10 Wait for the vacuum pressure in the upstream section of the Vacuum Section 2:VacSec-5 to drop below the 10^{-5} Torr by controlling the pressure reading from the cold cathode gauge 2:CCath-6.

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- 5.2.11 Enable the high voltage to the 2:IP-5 ion pump using EPS Vacuum Screen (Figure 5.1, right panel). Ensure that "HV ON/OFF status" turned to "ON".
- 5.2.12 Wait for the vacuum pressure in the Vacuum Section 2:VacSec-5 to drop below the 5×10^{-3} Torr by controlling the pressure reading from the cold cathode gauge 2:CCath-7
- 5.2.13 Close the pump-out valve in the upstream section (upstream of the C Hutch Slit 2:Slt-C, refer to the Attachment A, *Vacuum layout Drawing*) of the Vacuum Section 2:VacSec-5 AND turn off the turbo pump cart.
- 5.2.14 Vent the turbo pump cart AND disconnect the turbo pump cart from Vacuum Section 2:VacSec-5.
- 5.2.15 Reconnect the Solenoid Connector from Gate Valve 2:GV-5 (see Figure 5-2) .
- 5.2.16 Remove the yellow Caution Tag from the cable at the connector, in accordance with PS-C-PRC-AO-001, *Caution ("Yellow") Tags*.
- 5.2.17 IF the vacuum pressures in Vacuum Sections 2:VacSec-3, 2:VacSec-4, 2:VacSec-5 are below the EPS set point, THEN open Gate Valve 2:GV-5
- 5.2.18 IF the vacuum pressure in Vacuum Sections 2:VacSec-3 and 2:VacSec-4 is still below the EPS set point, THEN open Gate Valve 2:GV-4.
- 5.2.19 IF the vacuum pressure in Vacuum Sections 2:VacSec-3 and 2:VacSec-4 is still below the EPS set point, THEN open Gate Valve 2:GV-3.
- 5.2.31 Record the vacuum pressure in Vacuum Section 2:VacSec-3, 2:VacSec-4, and 2:vacSec-5 in the Beamline Logbook.

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REVISION HISTORY

REVISION	SECTION(S)	PAGE #	DATE	List of Reviewers	DESCRIPTION

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Attachment A – Vacuum Layout Drawing

