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| **SNS Return End Can Soft Shut Manifold Installation Procedure** | | | |
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# Purpose and Scope

The purpose of this document is to describe the critical steps necessary to successfully install the REC BP Assembly on an SNS PPU Cryomodule. Clean assembly techniques are meant to mitigate the generation of field emitters from the assembly and installation of this component.

**\*\*This is to employ clean assembly protocols and should be performed by experienced and trained personnel only.\*\***

# Terms and Definitions

CMA- Cryomodule Assembly

REC BP- Return End Can Beam Pipe

SME- Subject Matter Expert

Flow Hood Installation Procedure- (Link?)

Slow Pump Procedure-(Link)

# Roles and Responsibilities

Roles and responsibilities are defined by the SME and group leads as required to successfully complete this work

# Procedure

## Procedure

1. **Set up flow hood to begin the work on the return end of the cryomodule (Location TBD)**

* Close the cold gate valve and allow for the beam line vacuum reading to stabilize on the SEC Pump Drop.
* Verify the cold gate valve is closed.
* Verify the Nupro Valve is closed
* Hook up the slow bleed up diffuser to the nupro valve in a clean fashion and tighten to a uniform seal.
* Establish vacuum to the connection you just made and leak check the connection. Once the connection is verified to be leak tight, slowly open the nupro valve. This will make the vacuum spaces common between the beam line spool and the pumping station.
* Record the beam line vacuum in the cavity string.
* Begin the slow bleed up process while monitoring the beam line vacuum on the ion pump at the opposite end of the Cryomodule. If the vacuum reading rises, abort the bleed up process and pump down. Call the Supervisor.
* Once the bleed up is complete (780 Torr), close the nupro valve and remove the diffuser in a clean fashion. Cover the diffuser with a clean blank.
* Remove all Nupro valve flange bolts except for 2 of them at the 3 o clock and 9 o clock position.
* Blow the Nupro valve assembly with ionized nitrogen with the particle counter sampling cup under the flanges until the particle counter reads 0 particles on all scales.

1. **Install the soft shut valve**

* Slowly unbag the assembly to be installed, wipe it down with pre-soaked iso-towels and then blow down the entire surface while monitoring particle counts until they read zero.
* Lay the assembly on the wire cart, flange side down onto a clean iso-towel.
* Repeat the blow down the surface of the nupro flange until the particle counts read zero.
* Remove the remaining bolts from the nupro flange and remove the flange in a clean fashion. Your movements need to be slow and methodic to avoid cross contamination of your work.
* Install the Soft Shut Valve with a clean gasket to the beam line spool in a smooth and clean fashion.
* Tighten the bolts to a uniform seal.
* Install slow pump down hose to the Lollipop on the outside of the soft shut valve. **DO NOT ACTIVATE SYSTEM YET**
* Open the Soft Shut Valve
* Open the Nupro Valve on the Lolli pop assembly
* Activate the slow pump down system and leak check the installation. (reference small items leak check procedure)
* Upon completion of a successful leak check. Close the soft shut valve, then close the Nupro on the Lollipop.
* Slowly bleed up the turbo hose to the Lollipop.
* Remove the pumping system hose from the Lollipop and cover with clean blanks.

1. **Break down the clean space.**

* **After the flow hood is removed and out of the way, block the area around the assembly with stanchions to deter traffic from damaging the assembly**

# **Release and Revision History**

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| Rev # | Revision or update: | Effective: |
| A | Initial version | 10/15/2021 |
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# **Approvals**

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