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| **SNS Supply End Can Pump Drop Manifold Installation Procedure** | | | |
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| **Document Owner:** | Chris Wilcox | **Department Owner:** | SRF Ops |
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# Purpose and Scope

The purpose of this document is to describe the critical steps necessary to successfully install the SEC 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

SEC BP- Supply 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 supply end of the cryomodule (Location TBD)**

* Verify the cold gate valve is closed.
* Verify the Nupro Valve is closed
* Check the beam line vacuum on the ion pump power supply at the opposite end of the Cryomodule.
* 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/pump drop manifold**

* 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 pump drop assembly 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 ion pump right angle 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. Leak check to what spec?
* Upon completion of a successful leak check, continue pumping on the assembly until the vacuum reading in the turbo hose reads 1.0e-6 Torr or better.
* Install the magnet on the ion pump and turn on the ion pump.
* Once the ion pump is activated and the readings are stable, close the right angle valve.
* Slowly bleed up the turbo hose to the right angle valve watching the pressure reading on the ion pump power supply. If the pressure rises, abort the bleed up and inform the supervisor.
* Remove the pumping system hose from the right angle valve and cover with clean blanks.
* Close the Nupro valve on the lolli pop
* Close the soft shut valve.
* Allow the ion pump to pump on the assembly until the vacuum reading is within 1 order of magnitude of the beam line pressure reading seen at the opposite end of the cryomodule.
* When the two vacuum readings are within 1 order of magnitude of each other, slowly open the supply end cold gate valve.

1. **Break down the clean space and prepare for work on the Return End.**

* **After the flow hood is removed and out of the way, block the area around the pump drop 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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