Test Procedures for the NOvA Power Distribution System

After the LV and HV power supplies have been installed, and the PDBs have been connected, the following tests should be performed:[1]

☐ Call the NOvA control room before the start of the tests, and let them know that some of the LV power supplies and HV channels need to be turned off.

☐ **Turn off the LV power supply, and pull the plug.**
☐ Check that all cables are connected on the back of the LV power supplies
- the red 2AWG cable to 3.5V source (positions 1, 5, or 9 on the back side)
- the black 2AWG cable to 3.5V return (positions 2,6, or 10 on the back side)
- the yellow 6AWG cable to 24V source (positions 3,7, or 11 on the back side)
- the black 6AWG cable to 24V return (positions 4,8, or 12 on the back side)

☐ Check that all cables coming from the power supply and all cable which go to the PDBs are connected to the associated breaker at the breaker panel.
☐ Check that all LV cable connections are tight (**make sure that the power supply is turned off for this check!**)
☐ Check that the ring terminals of the LV cables at the back of the power supply don't touch each other, and that they don't touch the frame of the power supply.
☐ Check that the breakers on the breaker panel are on
☐ Check that all sense cable connectors are plugged in to the back of the LV power supply
☐ Measure the resistance between the each sense cable connector at the back of the power supply and the associated LV cable. The resistances should not be higher than 3.0 Ω.

- 3.5V source: _____ Ω

- 3.5V return: _____ Ω

- 24V source: _____ Ω

- 24V return: _____ Ω

☐ Check that all triax cables are connected to the HV breakout box. Also check that the connection is secure.

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[1] These are the procedures for the NOvA Near Detector

☐ Check that the LV Marine connectors are plugged into the back of the PDB. The right order of the cables (as seen from the top cover) is 6AWG (black), 6AWG (yellow), 2AWG (black), 2AWG (red).

☐ Check that the sense cable and HV cable is plugged into the back of the PDB, and that the PDB is connected to the ground strip via a ground braid and that the connections are tight.

☐ Check that all cable trays on the top of the detector are connected to the ground strip via a 10AWG cable.

☐ Turn on the LV breakers and the HV switch on the PDB

☐ Plug-in the plug of the LV power supply and turn on the power supply

☐ Turn on the 3.5V and 24V channel for one PDB, i.e. channels u0/u1, or u2/u3, or u4/u5. This can be done on the control display of the power supply or via snmpset.

☐ Turn on the HV channel for this PDB via snmpset.

☐ Check that all LEDs on the indicator card, the DCM card, and all FEB cards are on.

☐ Check the terminal voltage and the sense voltage of all channels of the power supplies via snmpget

- 3.5V channel: terminal: _____V sense: _____V

- 24V channel: terminal: _____V sense: _____V

- HV channel: terminal: _____V sense: _____V

☐ Check the LVs and HV on one random FEB channel of the PDB with a voltmeter on the FEB connectors. See picture on the right for the pinout of the FEB connectors.

- 3.5V channel: _____V

- 24V channel: _____V

- HV channel: _____V

☐ Turn off the 3.5V and 24V channel for the PDB. This can be done on the control display of the power supply or via snmpset.

☐ Turn off the HV channel for this PDB via snmpset.

☐ Call the NOvA control room after all tests are done.

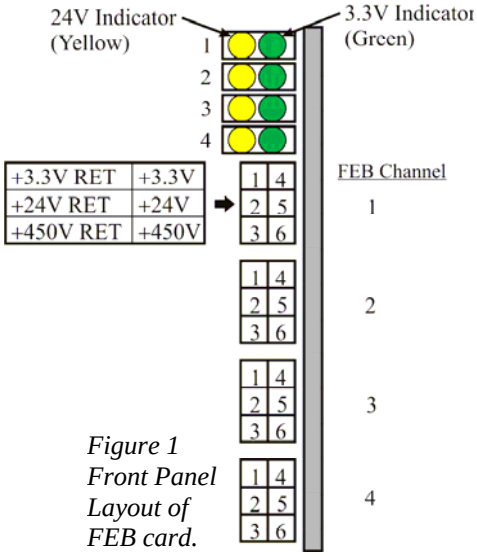

Figure 1 Front Panel Layout of FEB card.