TUPV019

Control System for 30 keV Electron Gun Test Facility

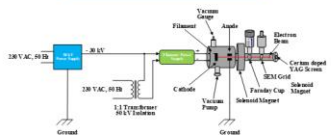
Authors: D. A. Nawaz, M. Ajmal, A. Majid, N. U. Saqib, F. Sher
(LINAC Project, PINSTECH, Islamabad)

ICALEPCS 2021

Introduction

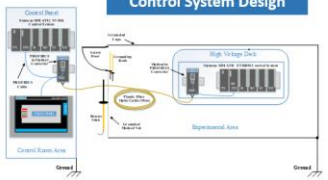
An electron gun test facility for indigenously developed 30 keV electron guns is developed to control and monitor various beam parameters by performing electron beam tests and diagnostics. After successful testing, electron gun is then integrated into 6 MeV standing wave linear accelerator. This poster presents the control system design and development for the facility.

Experiment Test Bench



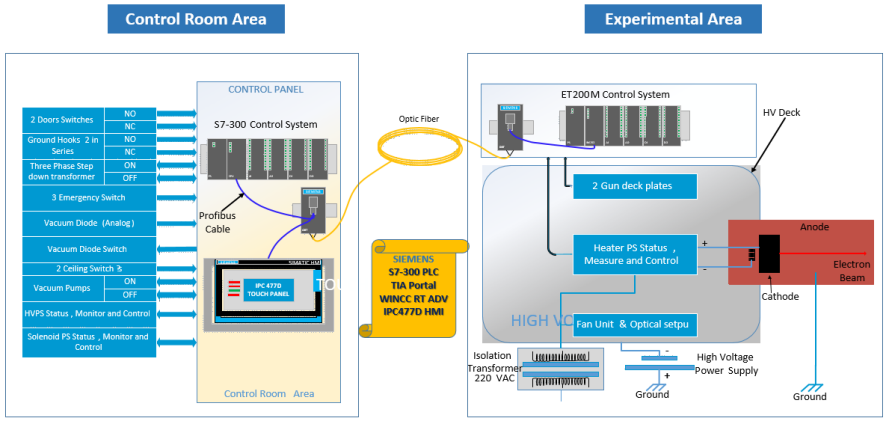
- CF-63 based test bench
- Diode type electron gun based on thermionic emission
- System evacuated down to 1e-8 mbar with turbo pump
- IMG-300 ionization gauge
- Faraday cup for target current
- Ce doped YAG screen to measure beam profile
- Low Voltage DC supply for electron gun filament
- High Voltage DC Supply for extraction

Control System Design



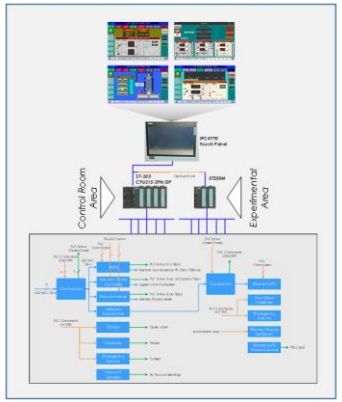
- Isolation of High Voltage (HV) and Low Voltage (LV) Area
- Modular and Centralized configuration
- SIEMENS Hardware
  - SIMATIC S7-300 CPU
  - ET200M Slave
  - I/O Modules
  - IPC 477D Touch Panel
- SIEMENS Software
  - TIA Portal
  - WinCC RT Advanced

Control System Layout



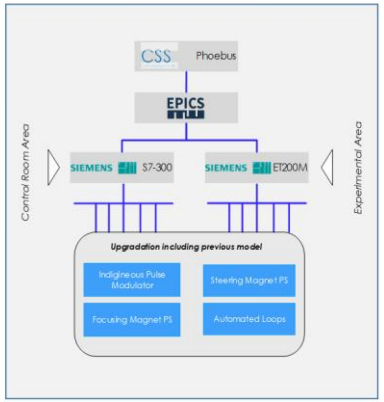
Control System Upgrade

Present Layout



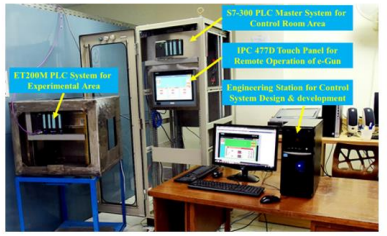
Upgrade

Planned Layout

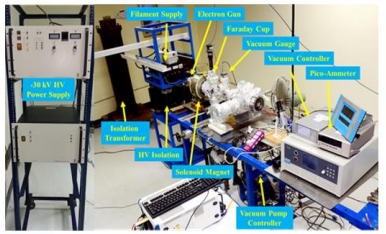


Experimental Facility

Control Room Area (Low Voltage)



Experimental Area (High Voltage)



Faraday Cage

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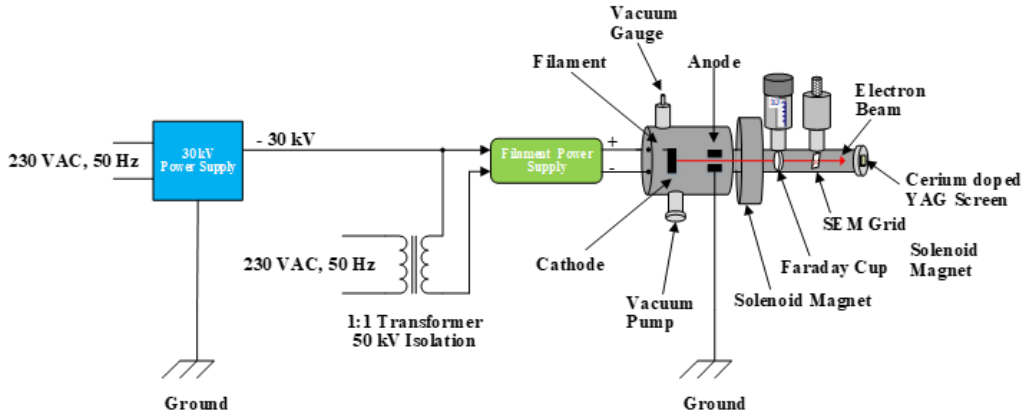

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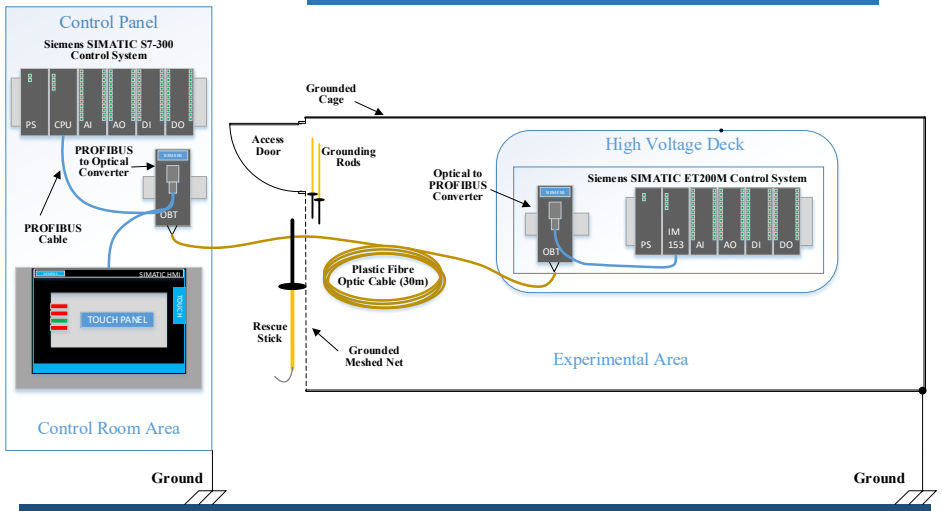
Control System Design



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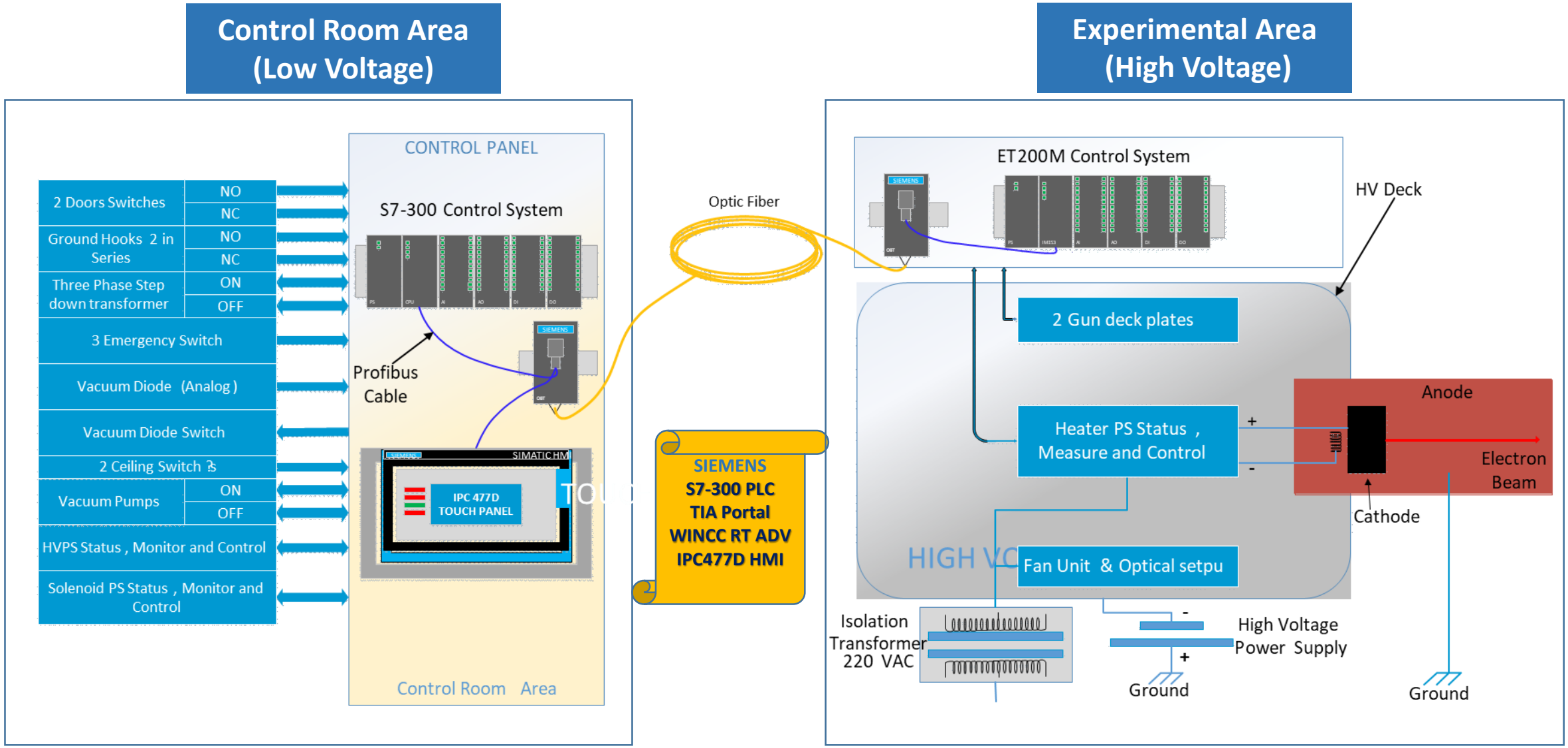
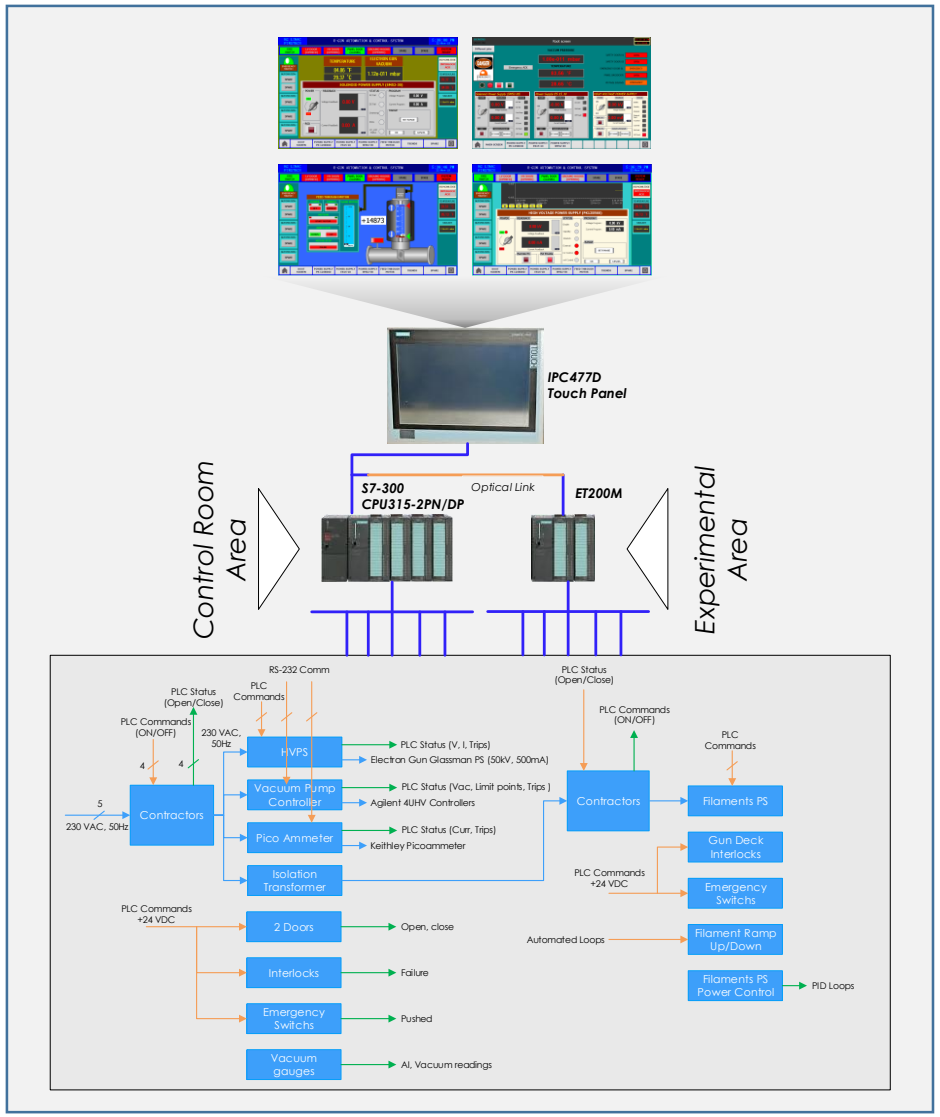
Control System Layout



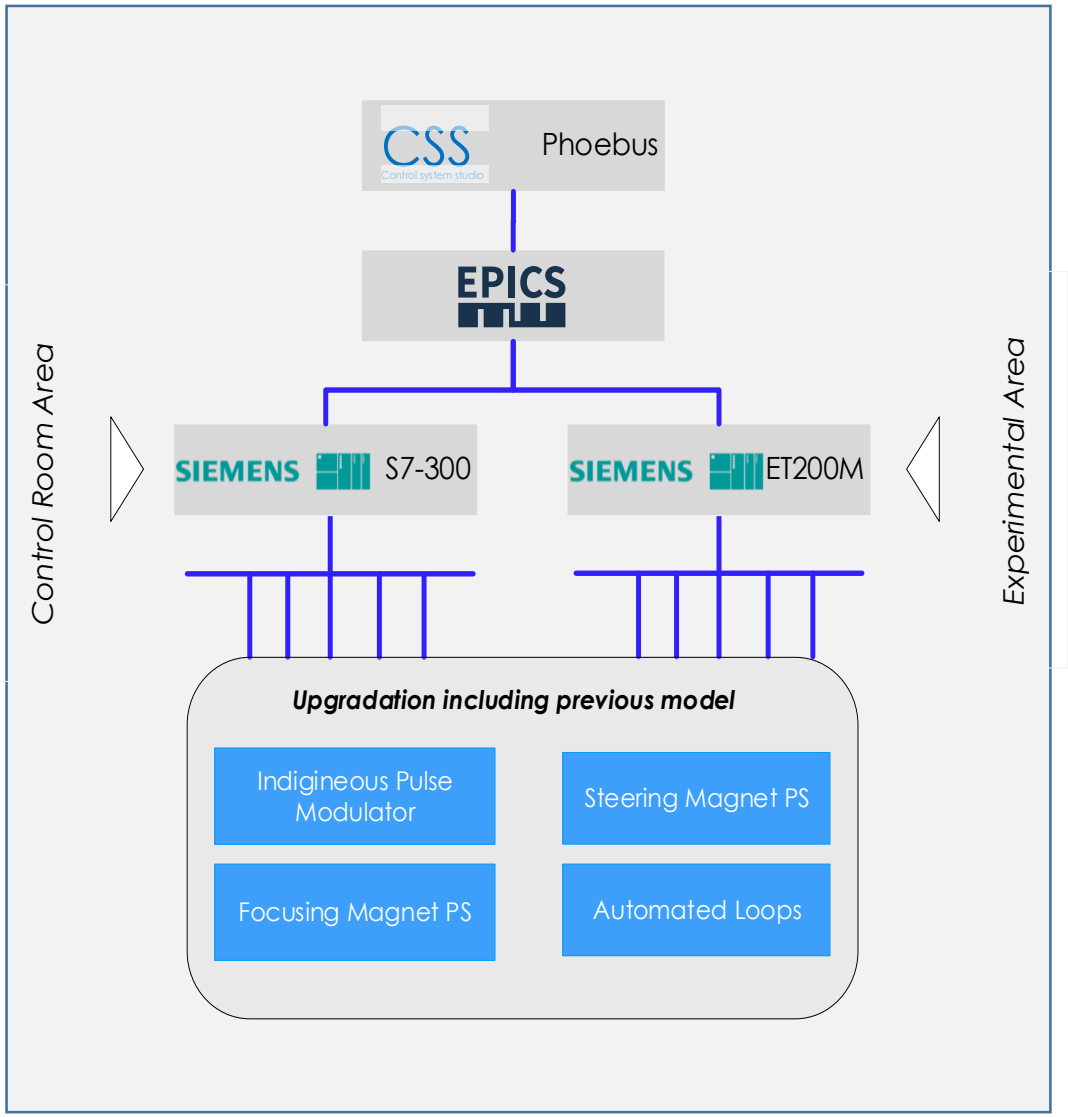
Control System Upgrade

Present Layout



Upgrade

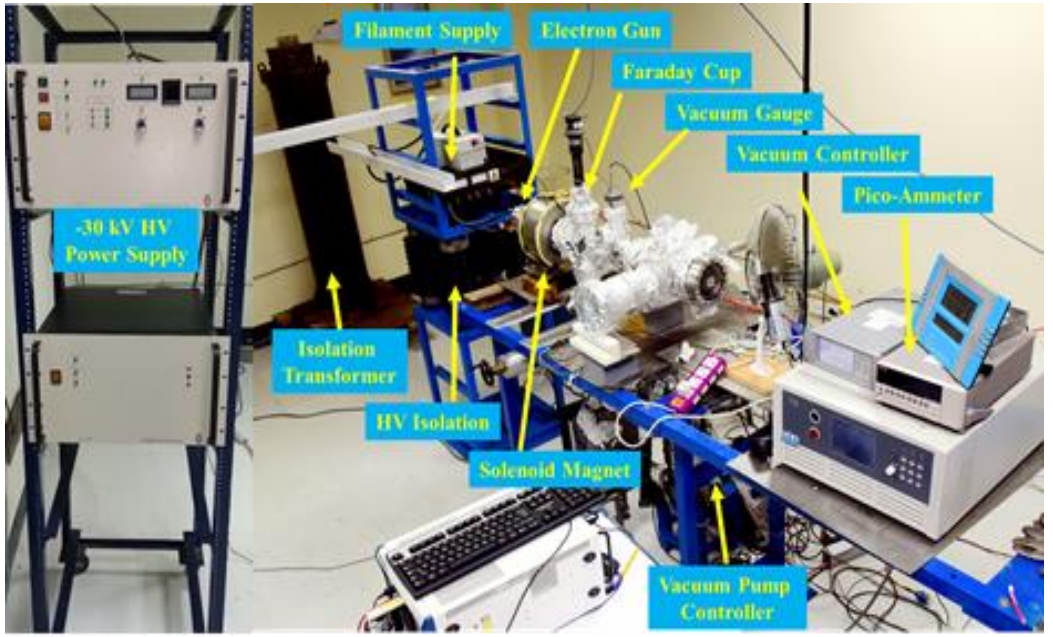
Planned Layout



Experimental Facility

Control Room Area (Low Voltage)

Experimental Area (High Voltage)



Faraday Cage