DSG HV Cable Schematic for NPS

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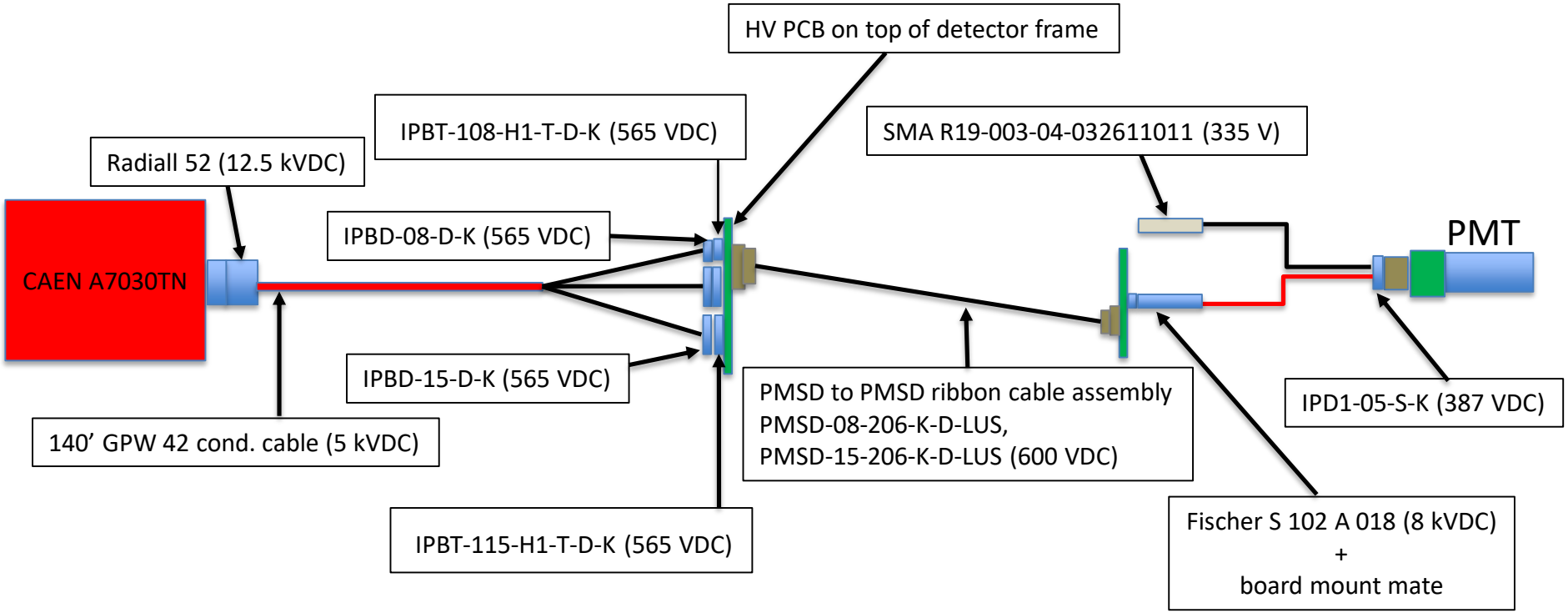
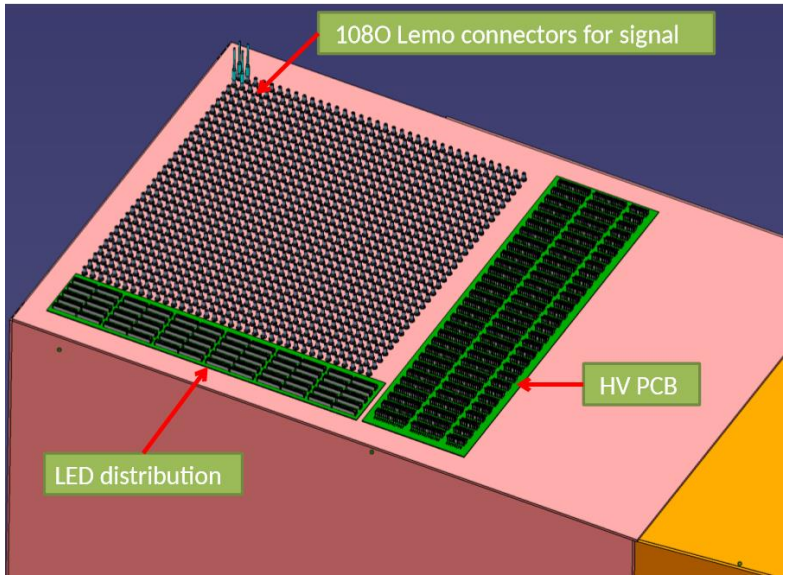
HV Flow Path for NPS



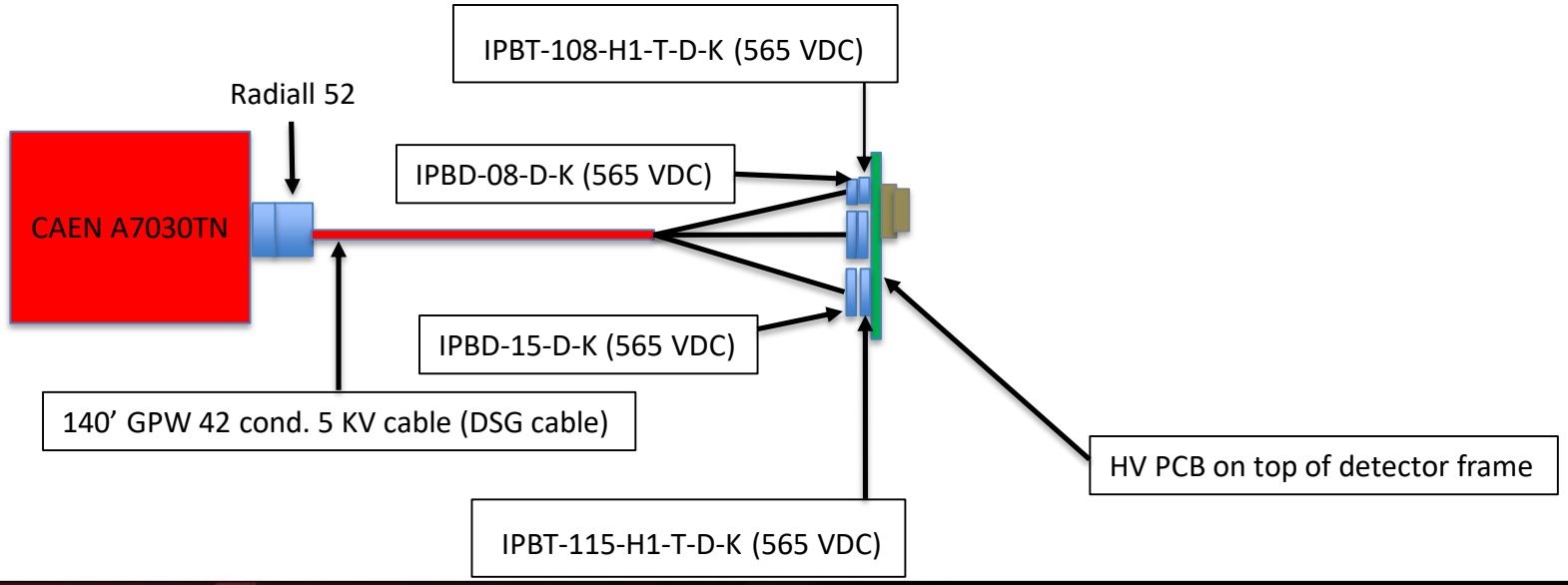
- HV is provided by the CAEN A7030TN module

*Voltage ratings in ()

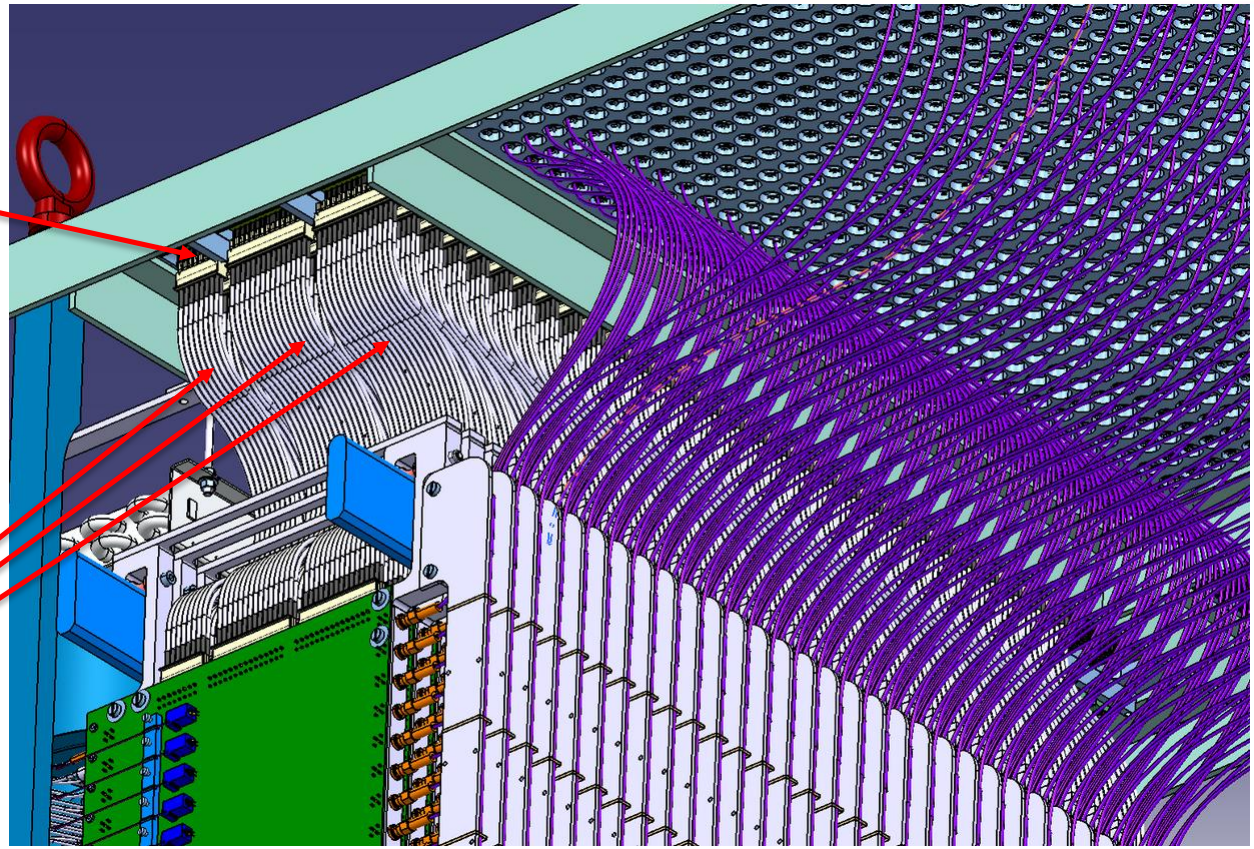
Top of Detector Frame (Outer)



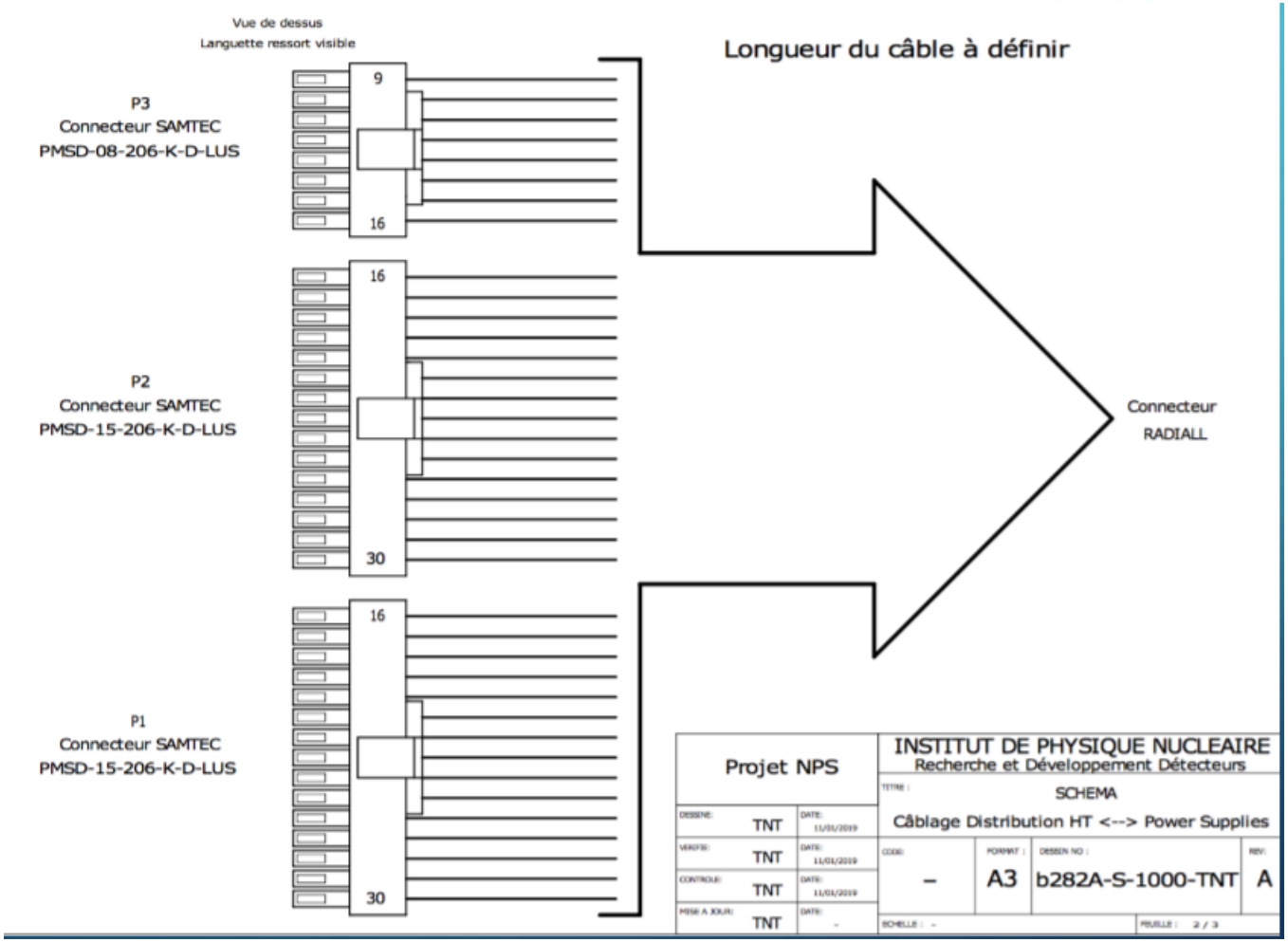
- A 140’ multi-conductor cable DSG is fabricating will run from CAEN A7030TN module to row on HV PCB on top (outside) of the NPS Detector Frame.
- Cable and board use SAMTEC connectors
  - Cable IPBD-15-D-K to board IPBT-115-H1-T-D-K (x2)
  - Cable IPBD-08-D-K to board IPBT-108-H1-T-D-K (x1)



Top of Detector Frame (Inner)

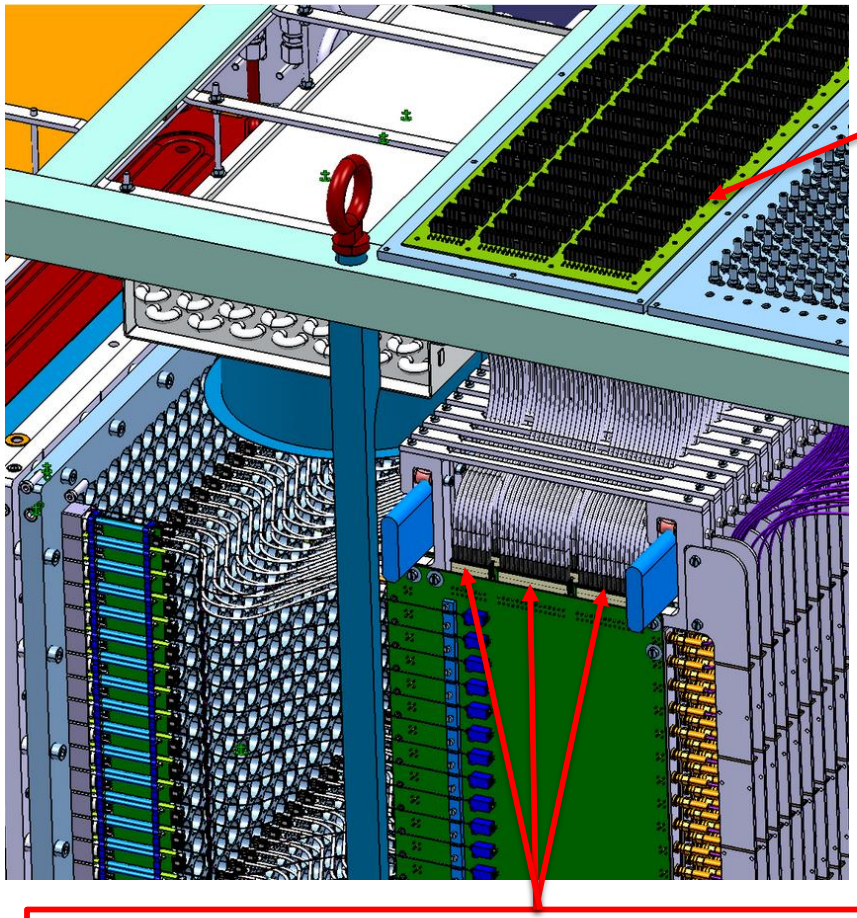


Ribbon Cable Connectors



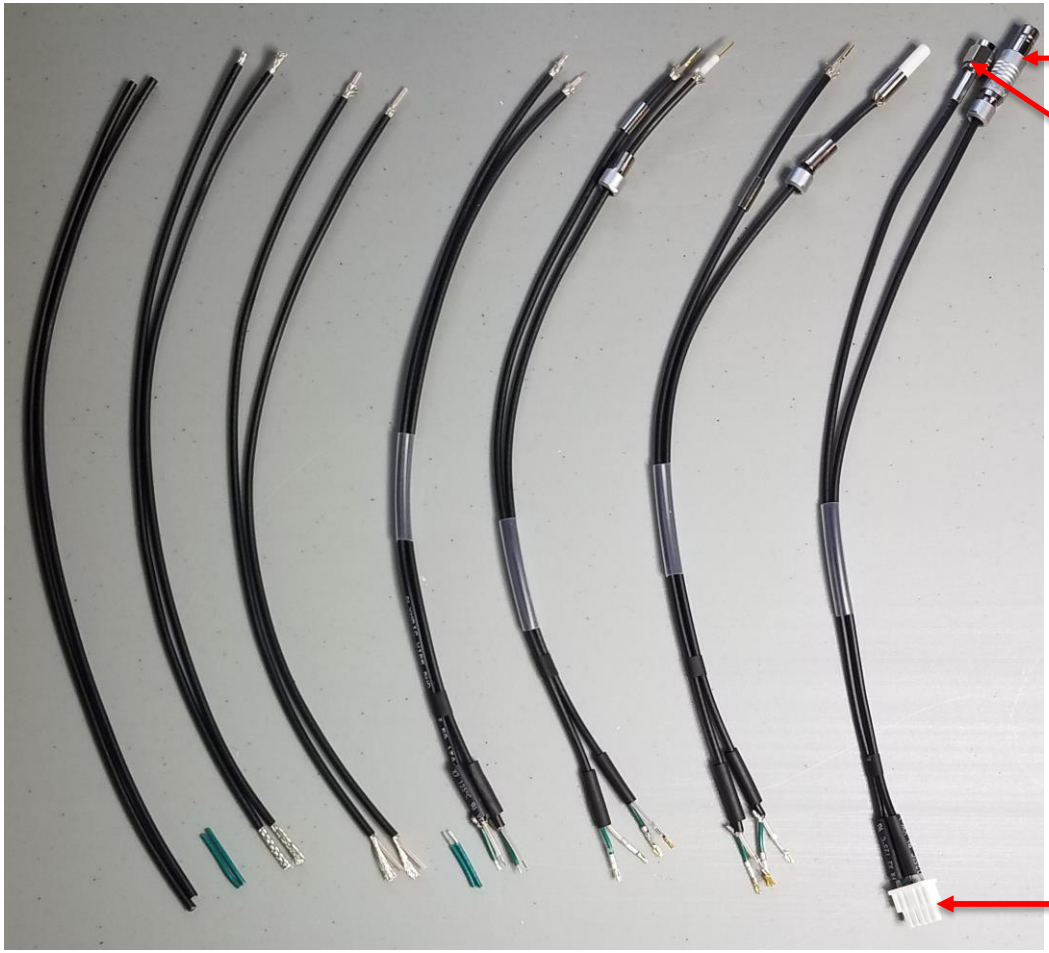
- Three SAMTEC connectors attach to underside of HV PCB on top of detector (inner).
- Other end attaches to PCB connected to PMTs.

Ribbon Cables to PMT HV



- The ribbon cables route from underside of HV PCB to a board where the HV side of the divider cable for each PMT is connected via a Fisher “S 102 A 018” connector
- One ribbon cable for each column of PMTs (36)

HV Divider Cable



Fischer S 102 A 018 connector

SMA R19-003-04-032611011 connector

- Divider cable provides HV to the PMT (Fischer to SAMTEC – right hand side)
- Left hand side of divider cable is for signal (SMA to SAMTEC)

SAMTEC IPD1-05-S-K connector

Connector Voltage Ratings

- SAMTEC IPD1-05-S-K
  - Connects divider cable to PMT base
  - Rated for 848 VDC per: https://octopart.com/ipd1-05-s-k-samtec-11550047#Specs
- Fischer S 102 A 018
  - Connects PMT HV to PCB
  - Rated for 8 kVDC per: http://www.farnell.com/datasheets/1271240.pdf
- SAMTEC PMSD-08-206-K-D-LUS
  - Ribbon cable assembly
  - Rated for 600 VDC per: https://static6.arrow.com/aropdfconversion/61d13c16bd11ffd18e988b15ce2de65ffa6e53ee/pmss.pdf

Connector Voltage Ratings (cont'd)

- SAMTEC IPBT-115-H1-T-D-K
  - Connector mounted on HV PCB located on top of detector frame (outer)
  - Mate for SAMTEC IPBD-15-D-K
  - Rated for 565 VDC per: http://suddendocs.samtec.com/catalog_english/ipbt.pdf
- SAMTEC IPBT-108-H1-T-D-K
  - Connector mounted on HV PCB located on top of detector frame (outer)
  - Mate for SAMTEC IPBD-08-D-K
  - Rated for 565 VDC per: http://suddendocs.samtec.com/catalog_english/ipbt.pdf

Connector Voltage Ratings (cont'd)

- SAMTEC PMSD-15-206-K-D-LUS
  - Ribbon cable assembly connecting from HV PCB on top of detector frame (inner) to PCB where the PMT's Fischer connectors attach
  - Rated for 600 VDC per: https://static6.arrow.com/aropdfconversion/61d13c16bd11ffd18e988b15ce2de65ffa6e53ee/pmss.pdf
- SAMTEC IPBD-15-D-K (2), IPBD-08-D-K (1)
  - Connect to the HV PCB on top of the detector frame (outer)
  - On one end of the 140' multi-conductor cable DSG will be fabricating
  - Rated for 565 VDC per: http://suddendocs.samtec.com/catalog_english/ipbd.pdf

Conclusion

- DSG is fabricating HV divider cables and 140’ multi-conductor cables for NPS
- There are safety concerns as none of the chosen connectors are rated for the operating voltage of ~1100 VDC

Thank You