DSG HV Cable Schematic for NPS

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## Contents

- HV Flow Path for NPS
- Top of Detector Frame (Outer)
- Top of Detector Frame (Inner)
- Ribbon Cable Connectors
- PMT to HV to Ribbon Cables
- Connector Voltage Ratings
- Conclusion
HV Flow Path for NPS

- HV is provided by the CAEN A7030TN module

*Voltage ratings in ()
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)
Under-side of HV PCB

Ribbon cables attach to HV board on top of detector frame supplying HV to PMT bases.
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.
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

- 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)

Fischer S 102 A 018 connector

SMA R19-003-04-032611011 connector

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](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](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](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

- **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
• 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/61d13c16bd11ff
d18e988b15ce2de65ffa6e53ee/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
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