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# Cable management and site and housing preparation

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# Cable management and site and housing preparation

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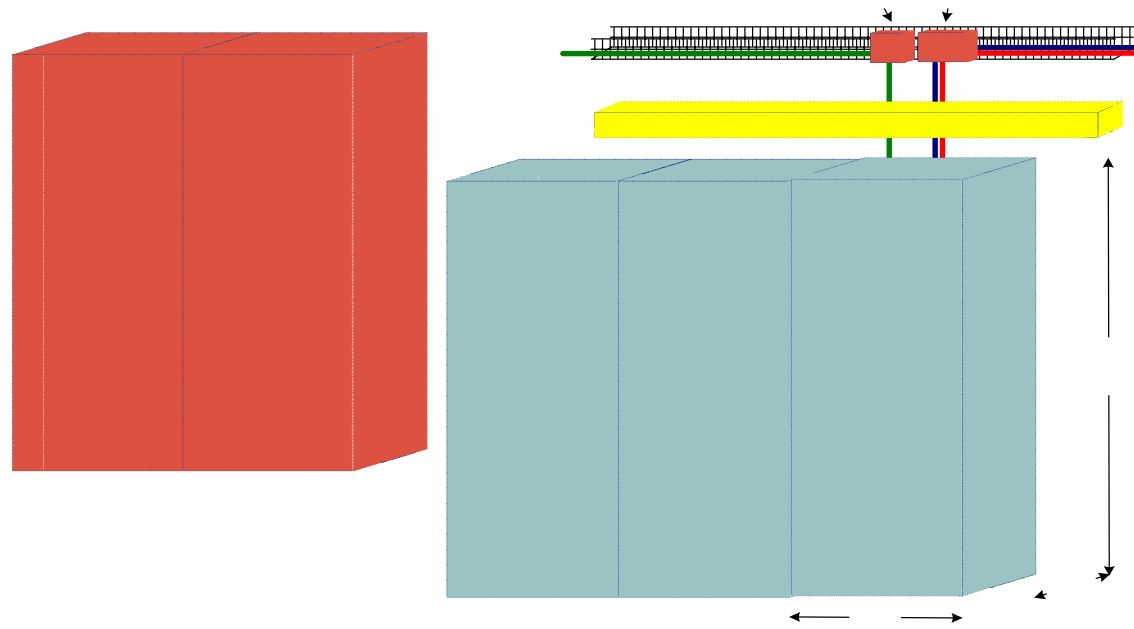
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# Site Installation

- In NORDUnet we have tried to enforce similar design and installation rules on all POPs. Of course local exceptions to these rules is applied!
- These rules includes separate fibre trays for fibre and other network cables. Also separate routes to racks for power cables are applied.



# Site Installation

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- Physical separated fibre access to the building
- Separated fibre trays and routes. Both for line-fibre access and to separate fibres and other network cables
- Totally separate routes for power cords. Both A and B supply separated, but also separate power from fibre and other network cables
- 2 ODF racks for line fibre termination (if not directly terminated in equipment) and 2 ODF for client termination

# Cable solutions

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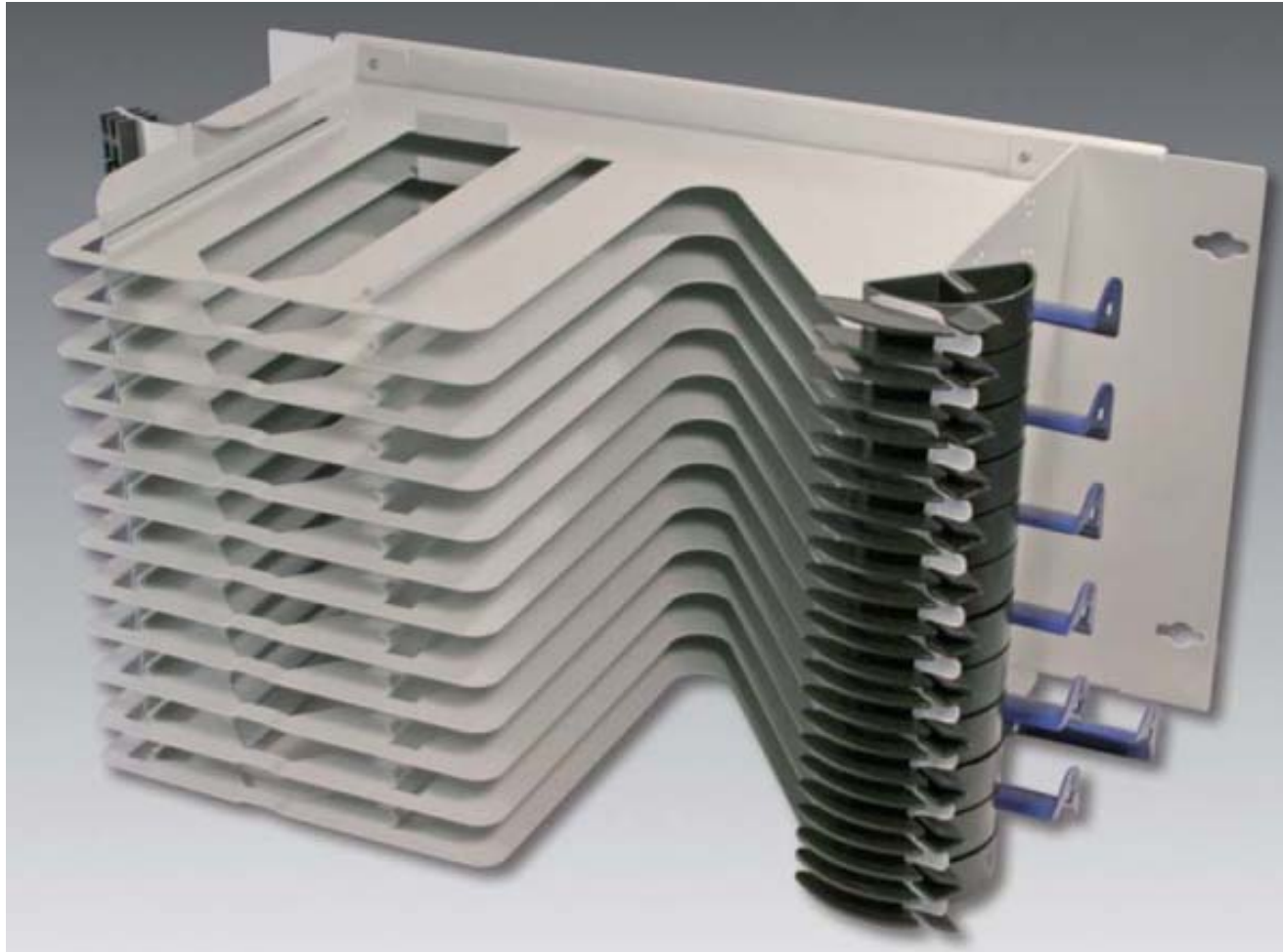
- To achieve best performance and as low attenuation as possible NORDUnet have tried to get fibre suppliers to deliver UN-patched fibres directly to the Alcatel equipment. Where this is not possible NORDUnet aim for a "Master cord" solution
- The "Master cord" solution chosen are 12 simplex fibre mounted (spliced as pigtails) in an ODR tray in one end and breakout patch cable with various connectors in the other end. This is used in both line and client end.
- Because the ODR tray has pigtails inside, it is easier to correct an error. The pigtail can be cut and a new connector can be reconnected to the cable.
- The advantages of this installation includes, an easy handover, as well as clear demarcation point

# Cable solutions



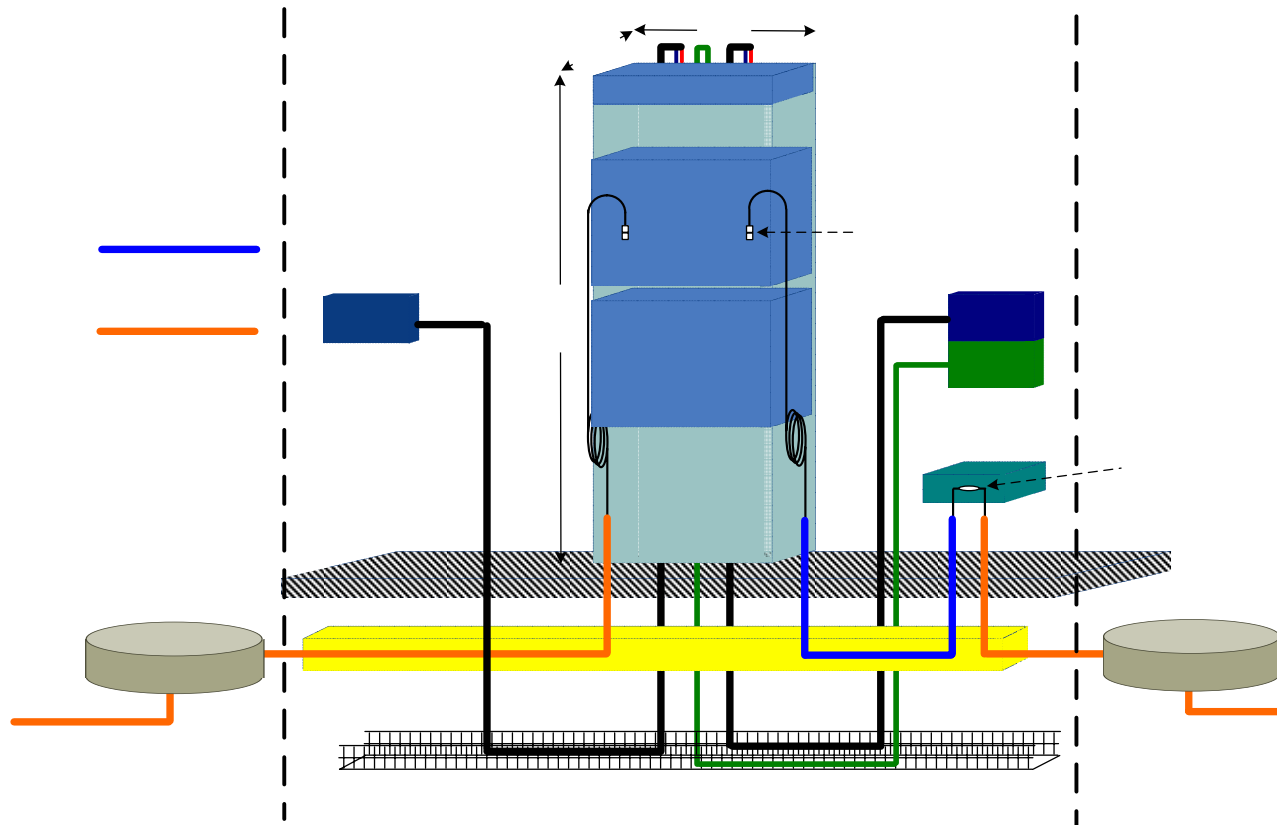
# Cable solutions

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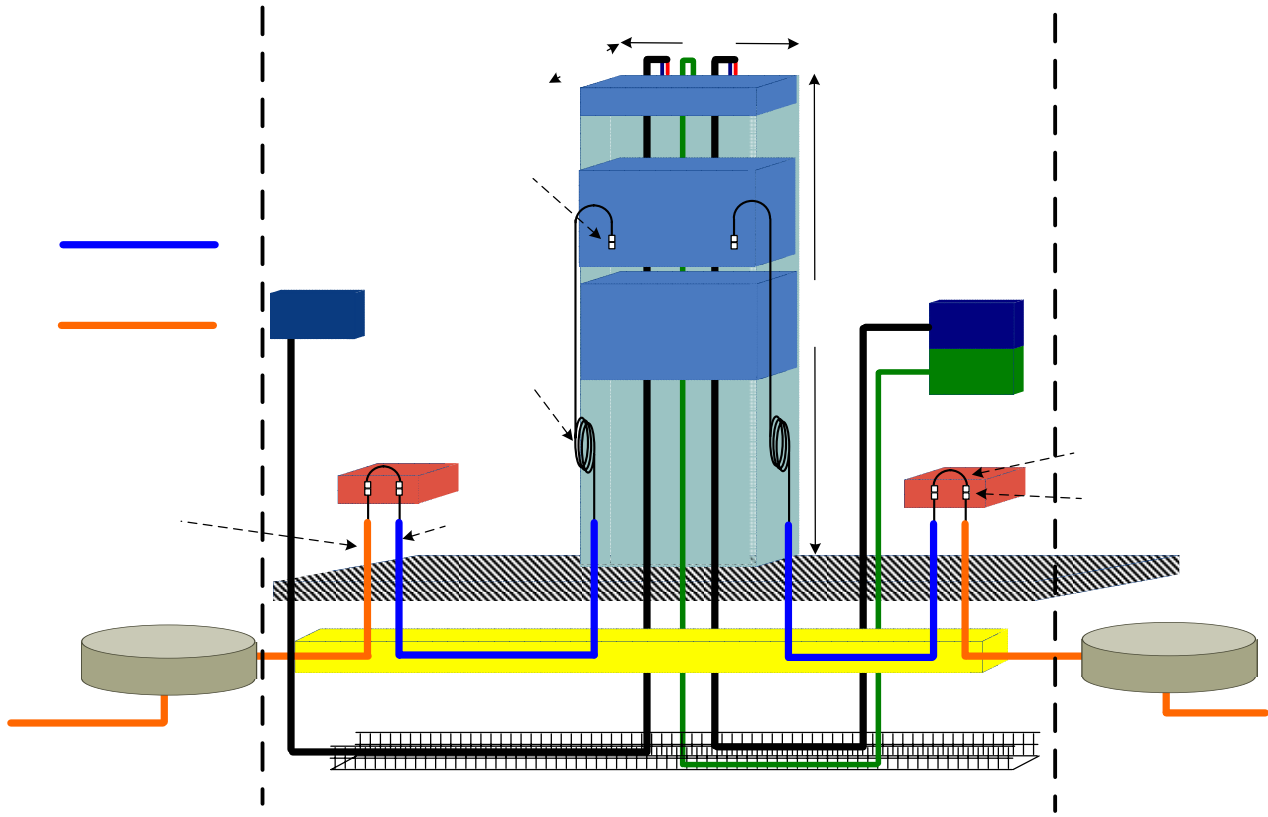


# Cable solutions

- POP to POP fibre structure showing the direct and in the ODF terminating line fibre

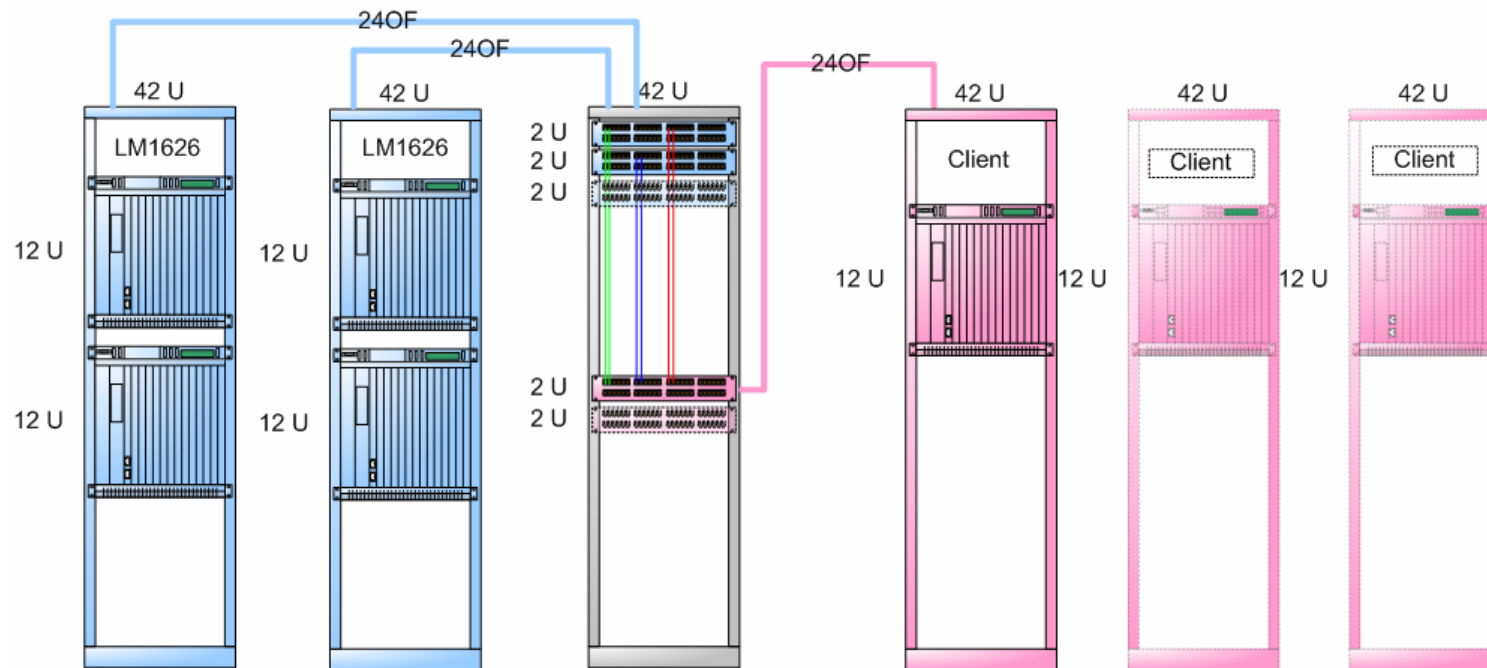


# Cable solutions



# Cable solutions

- POP fibre structure showing the idea towards deliver service to clients



## -48V solution

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- NORDUnet DC either is supplied by native -48V power feed from the housing facilities or by 19" mounted -48V AC/DC converters
- Supplier POWERWARE/EATON, providing anything from 5Kw to 32Kw
- The converters chosen offer a good ratio between cost, flexibility and scalability.
- Provides network surveillance capability .

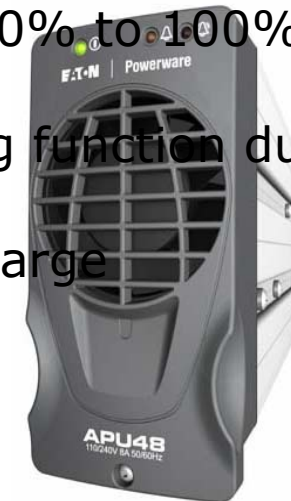


- Plug in PCB controller for APS Systems (APR Rectifier)
- RS232 Interface
- Ethernet Interface SNMP Protocol (SM45)

# -48V solution

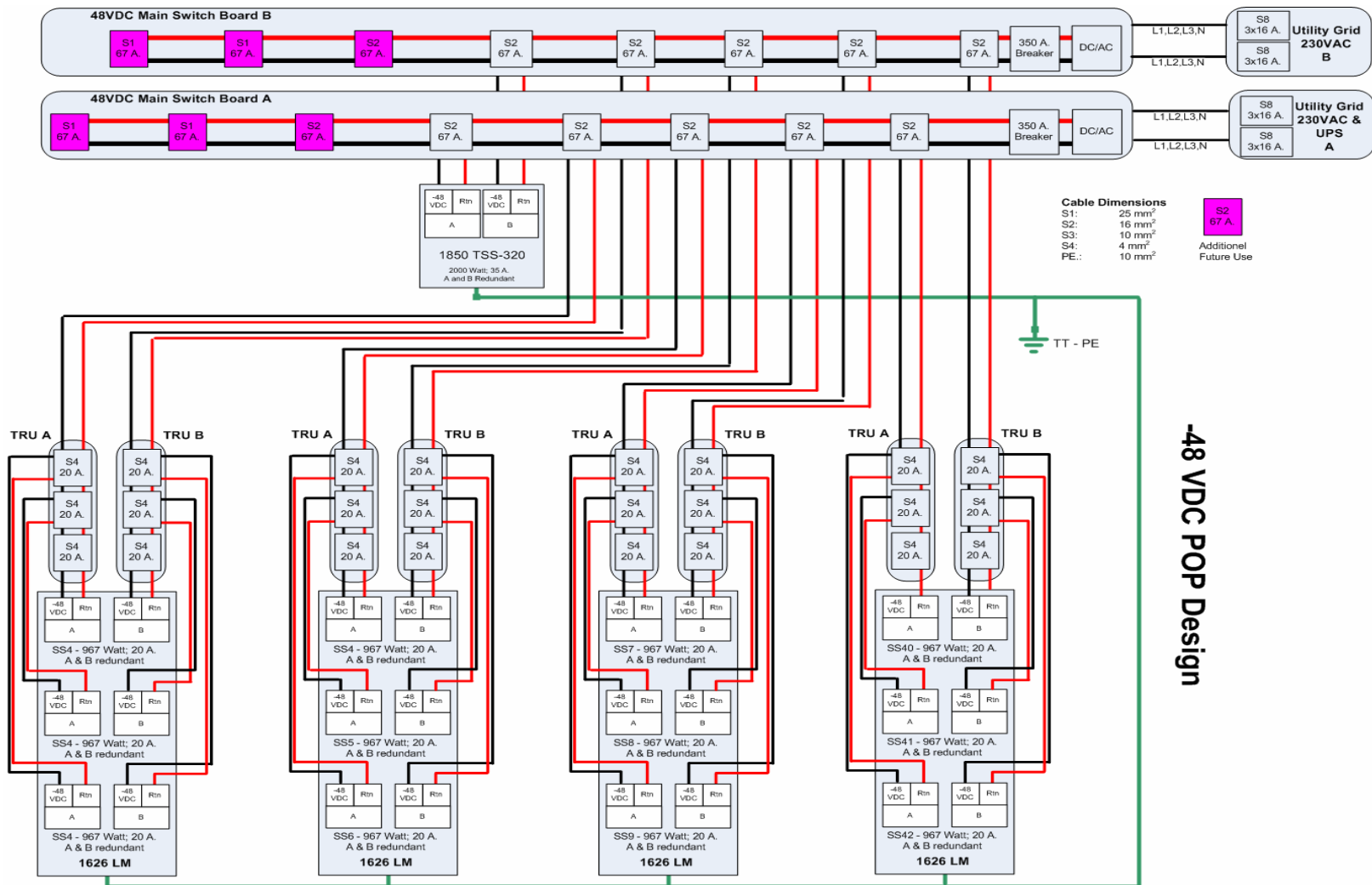


- C input operating range of 185 – 275V. (APR Rectifier)
- Enhanced input range to 300V
- Very high rectifier efficiency > 90% from 50% to 100% load.
- Current limiting function during battery recharge



# -48V solution

- NORDUnet POP -48V design



# Benefits and disadvantages using -48V

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- Lower power consumption
  - Lower loss in the AC/DC conversion, using the AC/DC converter. Rather than traditional switch mode power-supps. used in traditional AC telecom and IT equipment
  - Lesser cooling needs
  - DC powered components are far less susceptible to typical power problems associated with AC supply power, including surges, spikes, sags and brownouts
  - Assumed lower operations cost
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- Need for thicker power cables
  - Assumed larger installation cost
  - Another devices to monitor and master

# Project planning and control

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- It's NORDUnets experience that even a well defined and specified contract and work order can not help small issues becoming major topics under the installation. So a controlling role in the project planning, in the project control and management are strongly recommended.
- Topics as simple as sizes of a cable shoe could contribute as a major time killer.
- Quality assurance is a must. Labelling, cable mountings and routes must be double-checked. Labelling that was covered by the equipment, so they where unreadable. Line cables hanging in loops from the ceiling and A and B power feed stripped together, has been seen.
- Last but not least, documentation documentation documentation. WDM equipment are hardware heavy! This cause the necessity to be very strict in regards to documentation