

GET THAT EXTRA

PROVENTIA

POWER

Proventia Batteries



**Engineered for the Harsh
Use in Off-Road Machinery**



Depending on the application and electrification requirements, Proventia offers both low-voltage and high-voltage battery systems



SAFE LTO BATTERIES

FOR HARSH ENVIRONMENTS

EXPERIENCE EFFORTLESS TRANSITION to hybrid and electric machinery. With three decades of expertise in off-road machine technologies and a deep understanding of the unique demands and diverse operating conditions, we have developed batteries that perform reliably, no matter the conditions.

Choose Proventia and benefit from a robust battery module utilizing Lithium Titanate Oxide (LTO) technology. LTO's superior safety, stability, and reliability make it an ideal choice for the

challenges of harsh environments. From these modules, we have engineered battery systems that are tailored to fit your application.

BENEFITS OF PROVENTIA BATTERIES

Proventia battery technologies are based on lithium titanate oxide (LTO) technology. These batteries feature:

- High power (C-rates up to 10-40) for rapid battery charging and discharging.
- Extended lifespan—10 to 20 times longer than other lithium battery types.
- Efficient operation across a wide temperature window (-30°C to +60 °C).
- The robust structure of battery packs provides resilience against mechanical loads, dust and moisture.



PROVENTIA HIGH-VOLTAGE LTO BATTERY SYSTEMS

PROVENTIA EPRO HIGH-VOLTAGE BATTERIES are based on a modular platform and structure. Modularity allows for customization in both capacity and voltage, ensuring each application gets a perfect fit.

- Based on the most robust LTO battery technology for superior performance and lifespan
- Precisely engineered housing and electronics significantly enhance the system's durability
- Effective operation in temperature ranges where standard batteries struggle
- Optional active thermal management is available for optimal performance.

**LTO battery technology
for superior performance
and lifespan**



Applications

The flexibility of the Proventia High Voltage battery systems is ideal for meeting demanding requirements in hybrid and fuel cell machine applications. Proventia batteries are highly scalable to each application:

Hybrid applications

High-voltage batteries are perfect for peak power management in high-voltage hybrid systems. Batteries enable the use of smaller combustion engines and thereby decrease fuel consumption over the machine's lifetime, leading to lower CO₂ emissions and reduced Scope 3 downstream emissions. This means also lower overall ownership costs.

Fuel cell applications

In fuel cell applications, Proventia batteries provide rapid load response, enhancing the efficiency and lifespan of the fuel cell.

Full electric applications

For full electric applications where machine uptime and constant operation are important, batteries must be able to withstand repetitive fast charging. Our batteries can be fully charged over a short break instead of slow overnight charging – while keeping the excellent long lifetime of the technology.

Example of Proventia high-voltage battery specifications

| | 3M | 6M | 7M |
|-------------------------|--------------------|---------------------|---------------------|
| Nominal Voltage: | 166V | 331V | 386V |
| Capacity: | 3,3kWh | 6,6kWh | 7,7kWh |
| Peak Power: | 133kW | 265kW | 310kW |
| Continuous Power: | 32kW | 63kW | 74kW |
| Dimensions (W x H x L): | 700 x 185 x 635 mm | 700 x 185 x 1065 mm | 700 x 185 x 1210 mm |
| Weight: | 120 kg | 180 kg | 215 kg |

*Variants can be connected in series up to 1000VDC.
Custom-built batteries are also available.*



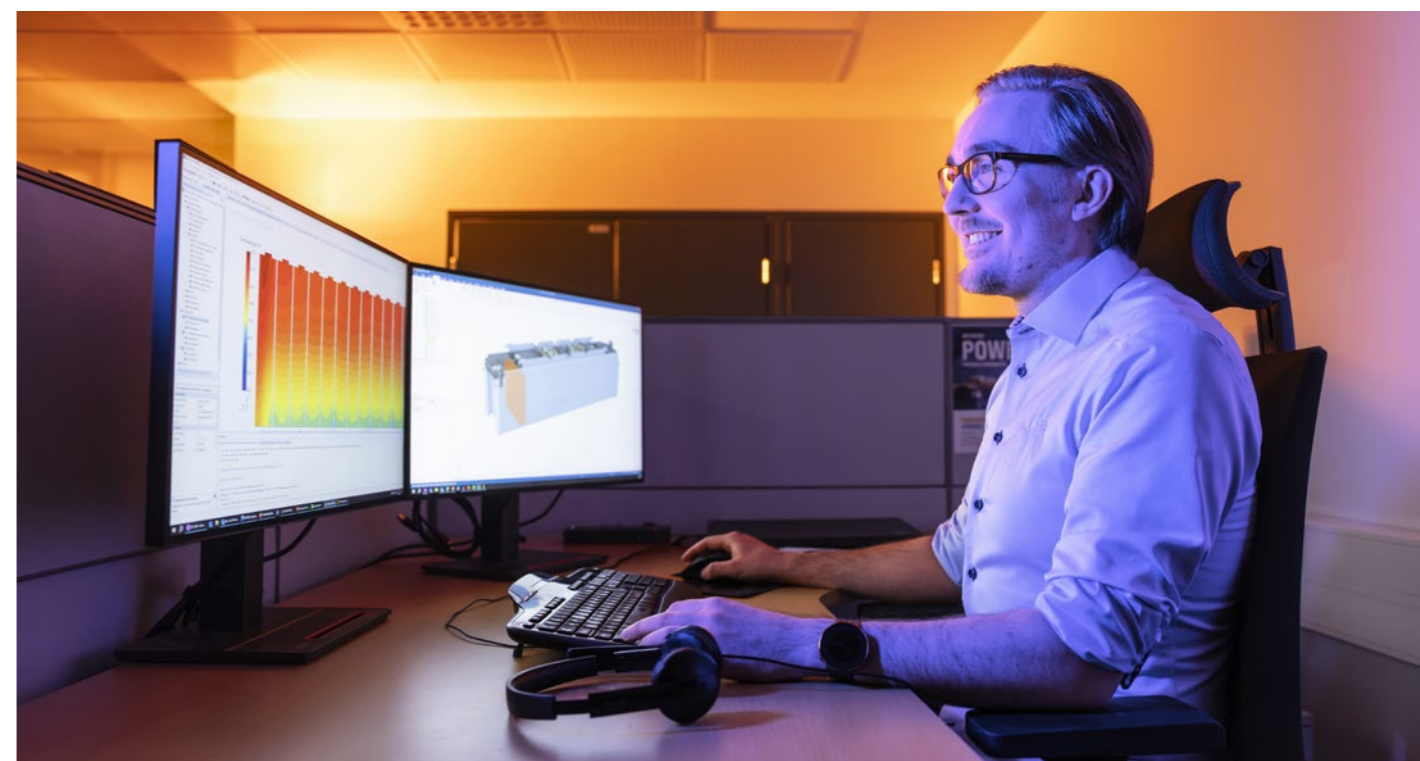
LOW-VOLTAGE

LTO BATTERY SYSTEMS

PROVENTIA'S LOW-VOLTAGE BATTERY SYSTEMS seamlessly integrate into machines with their compact, lightweight, yet robust structure.

- Based on the safest LTO battery technology
- Robust packaging and battery electronics for enhanced system reliability
- Operates in temperature ranges challenging for most standard batteries
- Optional active thermal management for maximum performance
- Engineered for harsh operating environments

Operates in temperature ranges challenging for most standard batteries



Applications

Mild hybridization

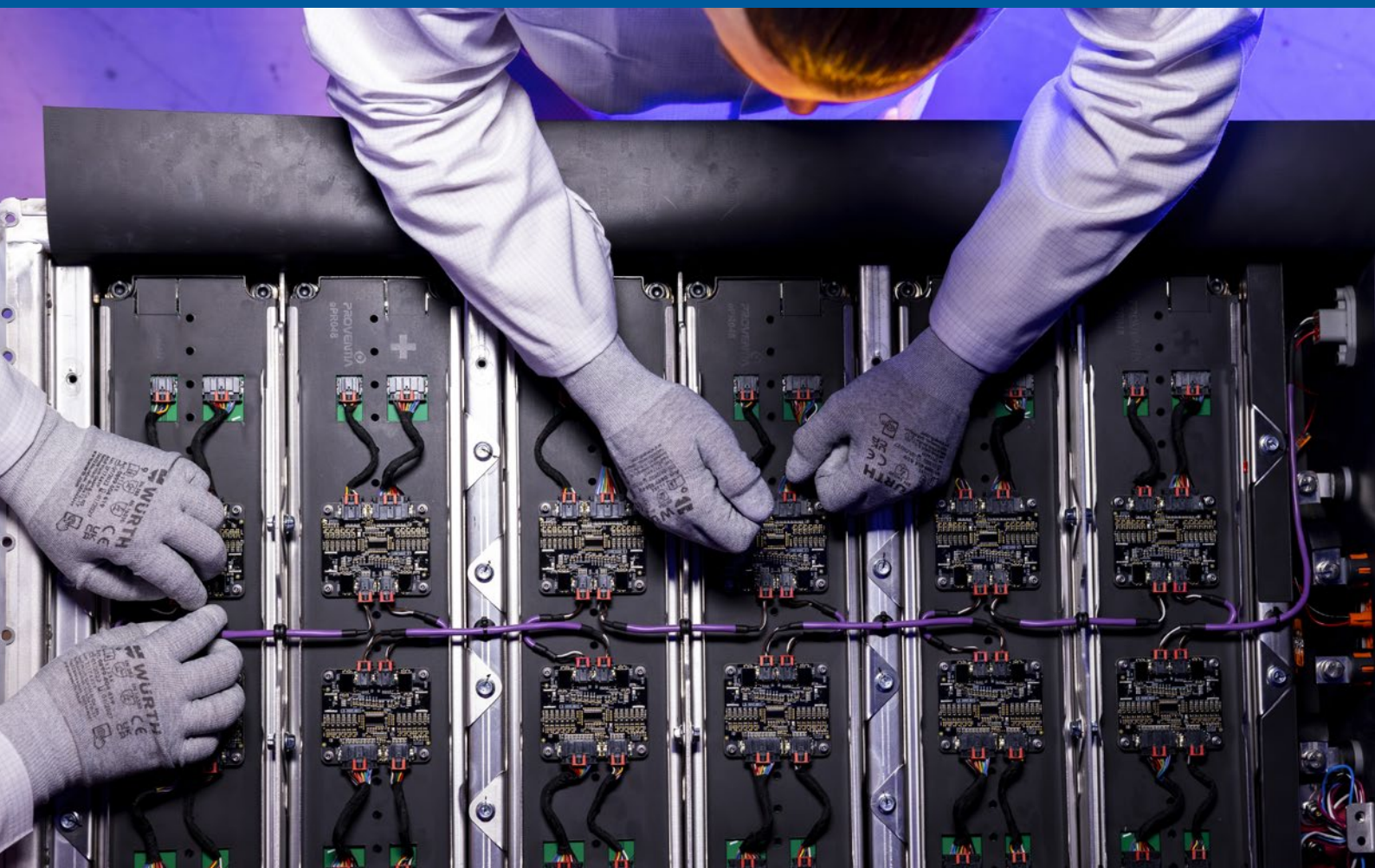
For the creation of mild hybrid off-road machines, we provide you with a low-voltage system tailor-made to your machine. Such a system can be, for example, Proventia ePRO48. Robust mechanical structure and wide operational temperature window of the ePRO48 battery offer high-level safety and long lifetime.

Enhancing the EAT System Performance

The Proventia low-voltage batteries can be used to enhance the EAT system performance. In such cases, low-voltage batteries provide additional power to heat exhaust aftertreatment systems in cold start and idle conditions. This feature is crucial for meeting future ultra-low NOx requirements in off-road machinery (Tier 5 and Stage VI), especially in low exhaust temperature scenarios. The ePRO48 can supply extra heat to enhance SCR performance in these conditions.

Example of Proventia low-voltage battery specifications

| | | | |
|-------------------|---------|-------------------------------|--------------------|
| Nominal Voltage: | 46V | Wide operational temp.window: | -30... 60°C |
| Capacity: | 0,9 kWh | Dimensions (L x H x W): | 580 x 235 x 190 mm |
| Peak Power: | 40 kW | Weight: | ca. 30 kg |
| Continuous Power: | 9 kW | | |



BATTERY SYSTEMS FROM A TRUSTED PARTNER

Proventia has dedicated 30 years to working with off-road mobile machines and their powertrains. We've gained the status of a trusted partner for numerous OEMs. Our extensive expertise is backed up by Proventia's Technology Center.

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