



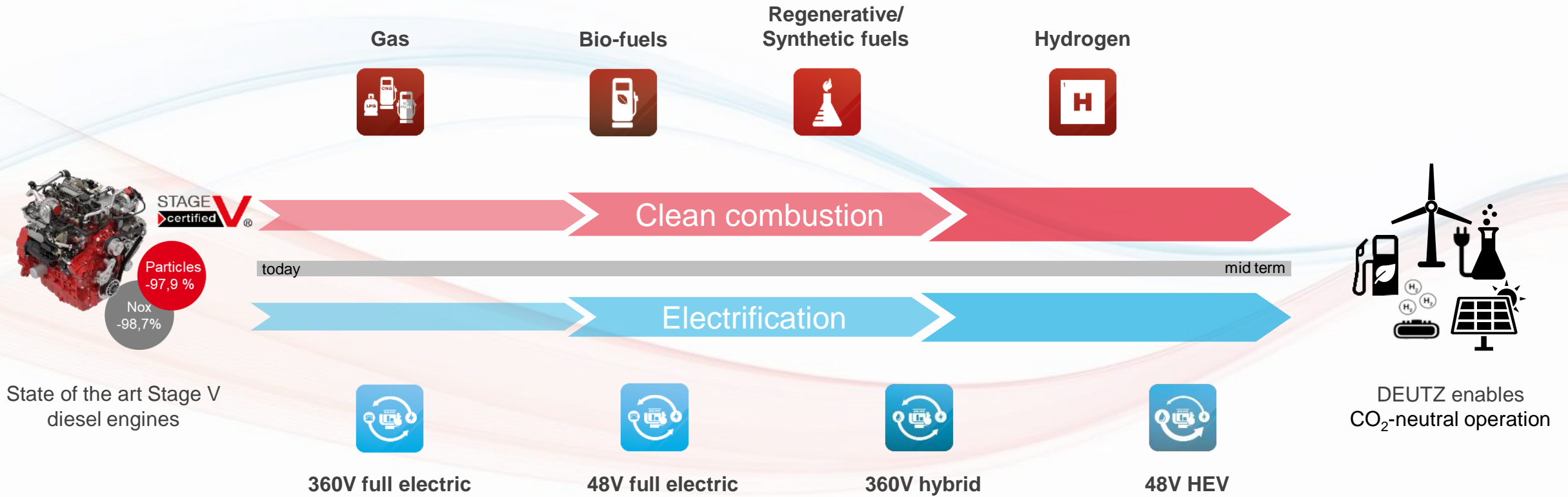
DEUTZ PowerTree



August 2021

DEUTZ Advanced Drive Systems

Evolution from CLEAN towards CO₂-neutral propulsion systems



E-DEUTZ Advanced Drive Systems

One stop shop for industrialization of electric drive-systems



Battery Experts

- Development & industrialization of battery systems
- BMS² & Components
- Engineering solutions
- Testing equipment
- Safety & Quality according to ISO26262
- Founded in 2013

Customized Drive Trains for NRMM¹

- Fully industrialized, easy to integrate drive trains for Off-Road OEMs
- Electric & hybrid drive trains in 48V & 360V
- Modular product kit for fast customer configurations
- Central functions as purchasing, sales & service
- Test environments for Systems

Electric Mobility on Water

- E-propulsion systems for a wide range of Marine applications
- Marine battery systems development & manufacturing
- More than 100k systems in the market
- Laboratories for batteries & drive system electronics
- Founded in 2005

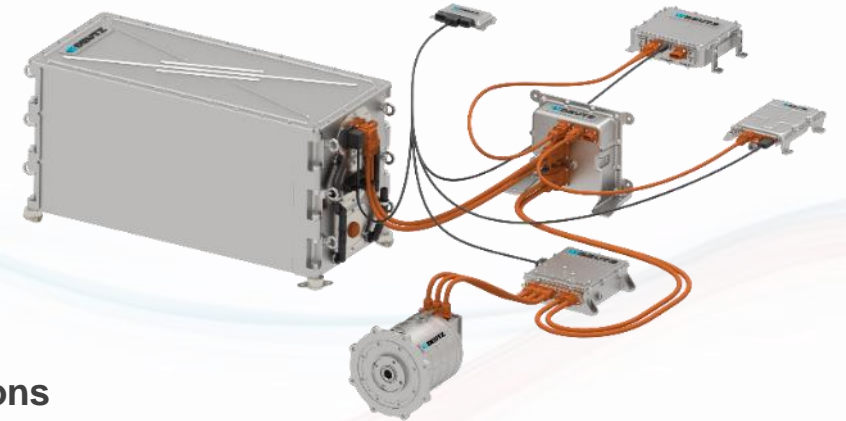
Strong network of established partners support industrialization of safe & reliable electric drive trains for NRMM

E-DEUTZ Advanced Drive Systems

Preferred partner for the application of electric drive systems

Resources and customer value delivering a strategic market advantage

- Long-term **leading provider** for development of **state of the art (IC) drive systems**
- In depth **knowledge of global NRMM market**
- Long-time experience in **industrialization and production** in Germany
- In-house **software development** and implementation
- In-house lithium-ion **battery / BMS development and production**
- In-house prototyping, **testing facilities and battery laboratory**
- Engineering team with extensive **know-how in low & high voltage drive-system applications**
- Long-term existing **global after-sales network** for complex products
- Growing production and supply base **footprint in Asia**



E-DEUTZ develops and industrializes marketable & individually applicable alternative drive-systems for the off-highway market



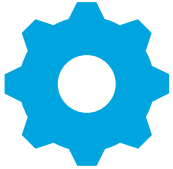
DEUTZ PowerTree


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Joint Project of Deutz and Torqeedo




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High End Industry Components
- 

The First Fast Charger for Construction Sites
- 

Easy Installation and Commissioning
- 

Zero Emission certified ✓
- 

High Flexibility Through Mobile Use
- 

100% Fast Charging without Grid Connection
- 

Balancing of Grid Power fluctuations



E-DEUTZ - Systems & Components

PowerTree – High power charging unit

- Ensuring power supply for electrically driven off-road applications at the point of use
- Input supply up to 63 A @ 400 V (CEE)
- Output: fast charging up to 150 kW (also without grid connection)
- Mobile use and robustly designed in 10ft sea container, suitable for construction sites
- Buffer storage in form of E-DEUTZ batteries
- Digital services - charging management for multiple vehicles, consumption-analysis and billing
- Suitable for various applications



DEUTZ PowerTree

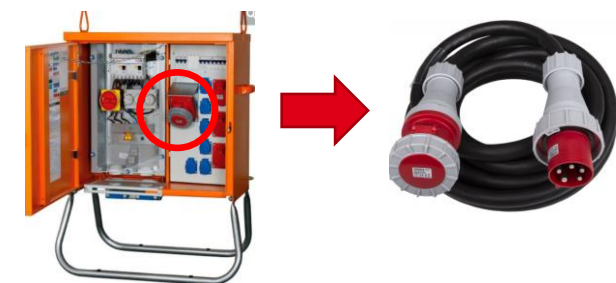
Specifications: Fast Charger for Off-highway applications



Technical data	
Dimensions	3.000 mm x 2.500 mm x 2.600 mm
AC Input	63 A @ 400 V (CEE)
Battery Capacity	126 kWh (modular)
Charging Points	2 x CCS + 2 x CEE (400 V + 230 V)
Fast Charging	1x 150 kW Charging Power at 800 V or 2 x 75 kW Charging Power at 800 V
AC Output	32 A @ 400 V + 16 A @ 230 V (CEE)
Operating Modes	On-grid + Off-grid DC- & AC-Charging of Applications
Fire Detection System	Yes
Lifetime	10 years
Total Weight	ca. 4.500 kg
DEUTZ Digital Service	Status of Fast Charger via Mobile Communications

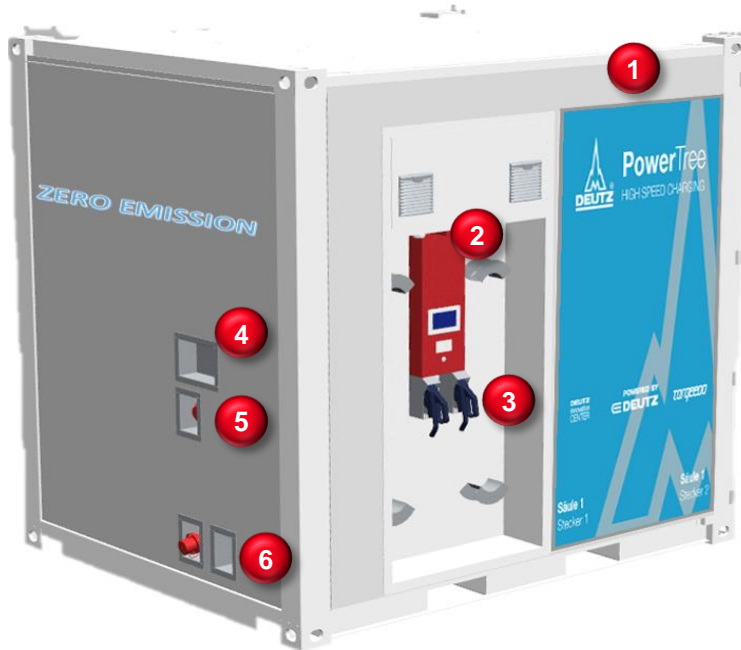


63 A @ 400 V (CEE)
is the same power connection as:



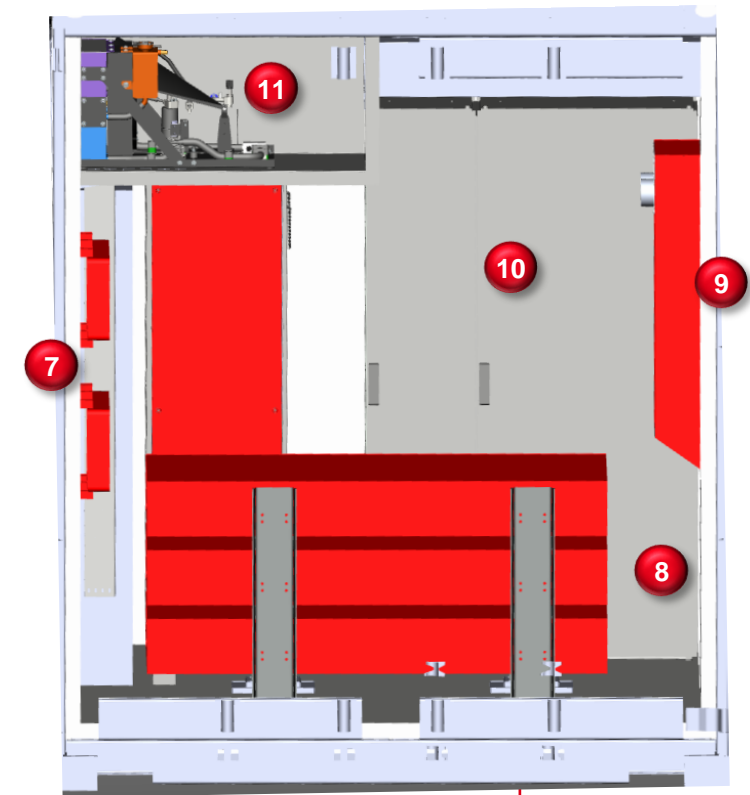
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Description of interfaces and internal view – Prototype example



Front- / Site view

- 1 10 ft. High-Cube-Seecontainer
- 2 Integrated DC Charger
- 3 Output
CCS Typ 2 (800 V: 1 x 150 kW or 2 x 75 kW (opt.))
- 4 HMI
Start and Control of the System
- 5 Output
230 V 16A / 400 V 32A
- 6 Power Supply
63 A / 400 V CEE
- 7 2 x 22 kW Charger
- 8 3 x HV-Battery á 42 kWh = 126 kWh
- 9 Containerventilation
- 10 Control Cabinets Installation
space for inverter, PT control, telemetry, etc.
- 11 Cooling System for HV-Batteries



Internal view

DEUTZ PowerTree

Mobile Plug & Play Fast Charger for Off-highway applications

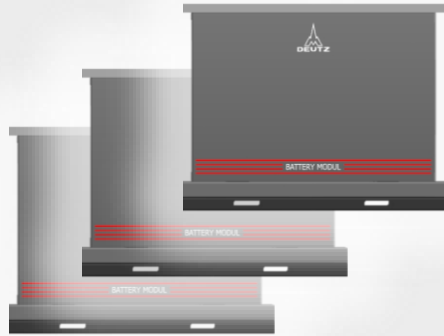


- No trained personnel necessary
- Short commissioning and deinstallation time
- ‘Off-grid’ stand-alone operation through battery storage
- Maximum flexibility through mobile use
- Use despite poorly developed local infrastructure
- Robust container solution for construction site operation
- Enables capacity reduction of the battery and more compact installation dimensions in the construction machine / vehicle

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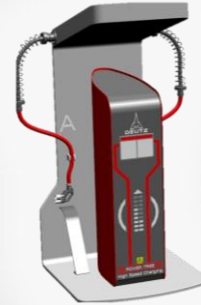
Modular Concept

Extendable
battery storage



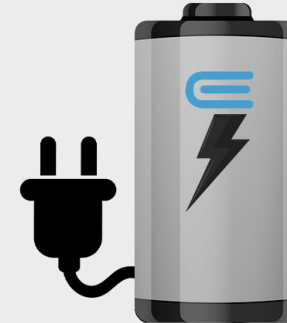
Scalable up to 252 kWh

Charging system
with 800 V



Additional charging points possible

Fast-charging technology



Fast charging power up to 150 kW

MOBILE SYSTEM



SCALABLE CONTAINER
SOLUTION

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Extended off-road possible applications



real construction site use

Google headquarters in Munich

- 800 V electric excavator is used to cut away a concrete foundation
- up to 10 hours a day in use



PowerTree reloads the excavator via booster charges during breaks!



Deutz Digital Services

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DEUTZ PowerTree

DEUTZ Digital Services

Basic functions

- Operating data of the charging station

Advanced functions

- PowerTree – App
- Operating data from the e-vehicle (based on CCS protocol)
- Billing management
- Geofencing
- Fire alarm
- Fleet management
- Remote maintenance



Disclaimer



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Vielen Dank!



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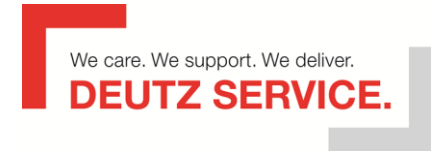


Backup

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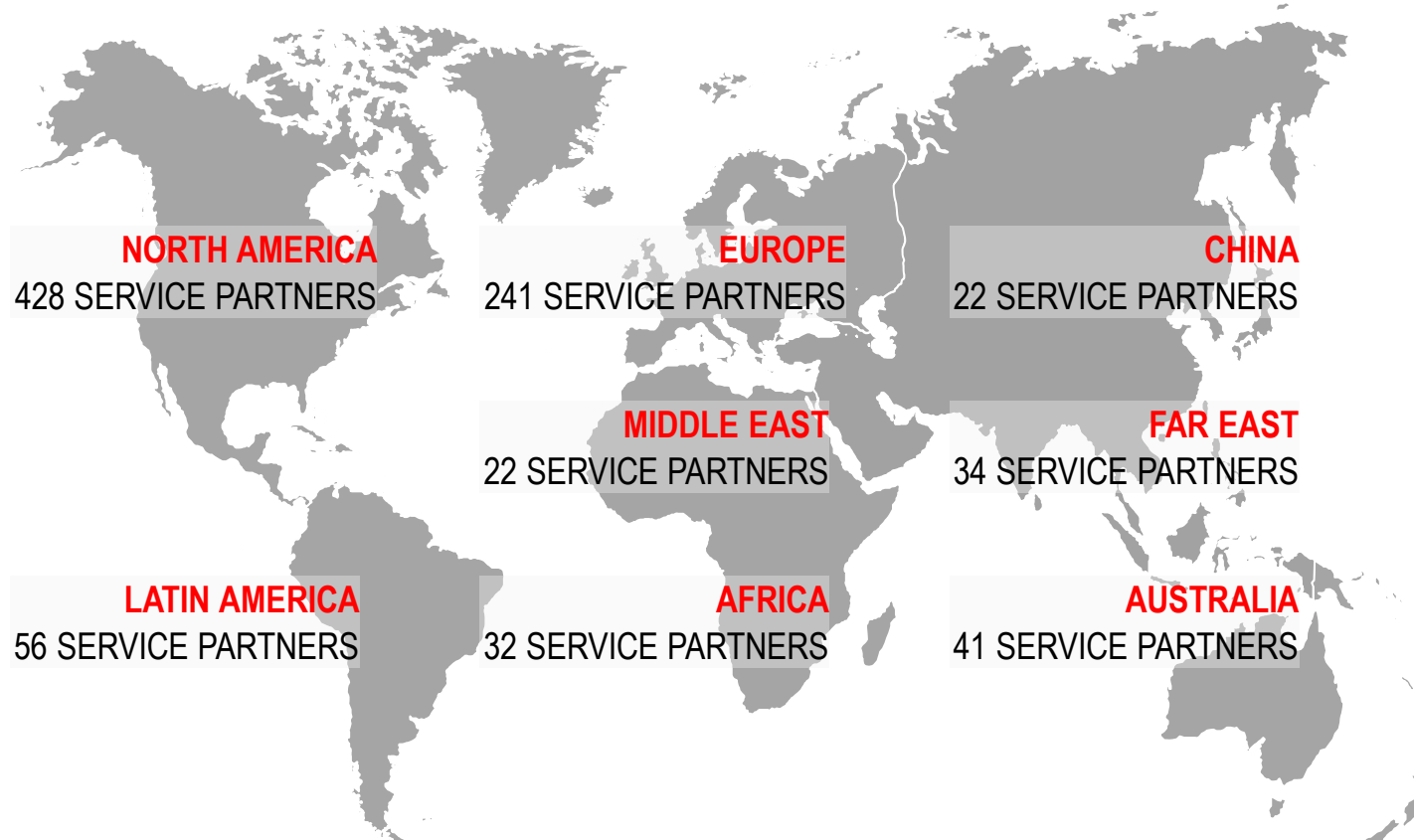
DEUTZ Service Network



- 876 Service partners worldwide providing 24/7 support to DEUTZ customers

DEUTZ owned subsidiaries:

- Europe
 - Deutz Italy,
 - Deutz France,
 - Deutz Benelux,
 - Deutz Spain,
 - Deutz UK,
 - Deutz Balkan+
- Deutz AMERICAS
- Deutz ASIA



Global Service Coverage:

- ABC – Dealer Network
Engine Dealers & Service Partners
- Regional Hubs (e.g. Middle East)
- MAN in VAN Concept

Digital Solutions:

- Parts Shop (Online-Shop)
- Digital Documentation
Service Booklet, Parts Identification
- Live Maintenance & Repair
- Telematics
Series Production + Field Retrofit
- Condition Monitoring/
RemoteServices
Dashboard Solution (Cloud2Cloud)

Service Product Portfolio:

- Maintenance & Overhauls
Engine Dealers & Service Partners
- Parts incl. Luidquids / Oils
- Xchange Engines & Parts
- Service & Repair Contracts
- Extended Warranties

