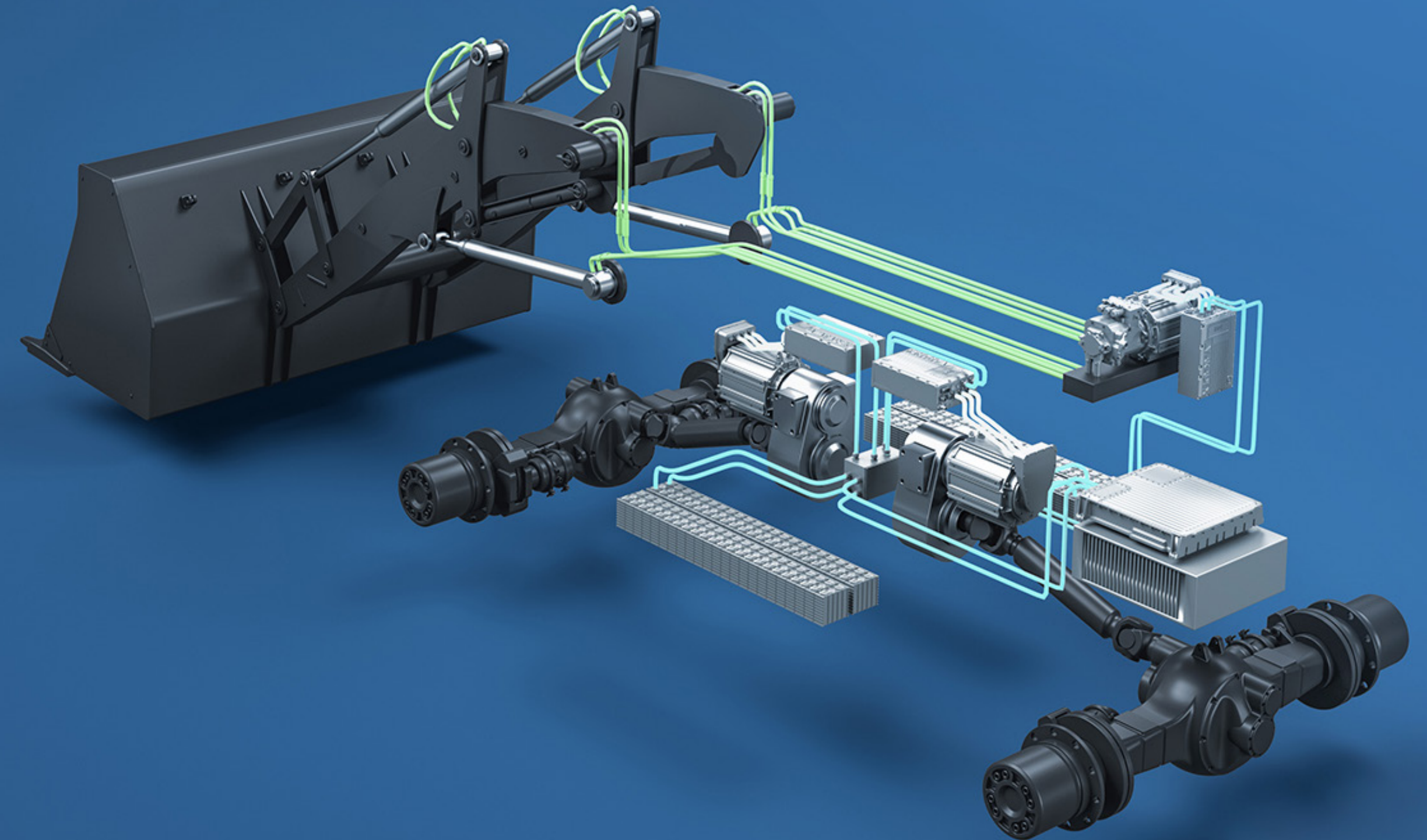


ARADEX portfolio and subsystems

We drive new energy - for a greener future



/ Content

I

INVERTERS AND MOTORS

Hardware for propulsion
and functional drives

II

MULTI-ENERGY-CONCEPT

Battery, fuel cell, diesel-hybrids:
Starting now and future proof

III

EXAMPLES

Components and subsystems:
Our market approach

IV

ENGINEERING SUPPORT

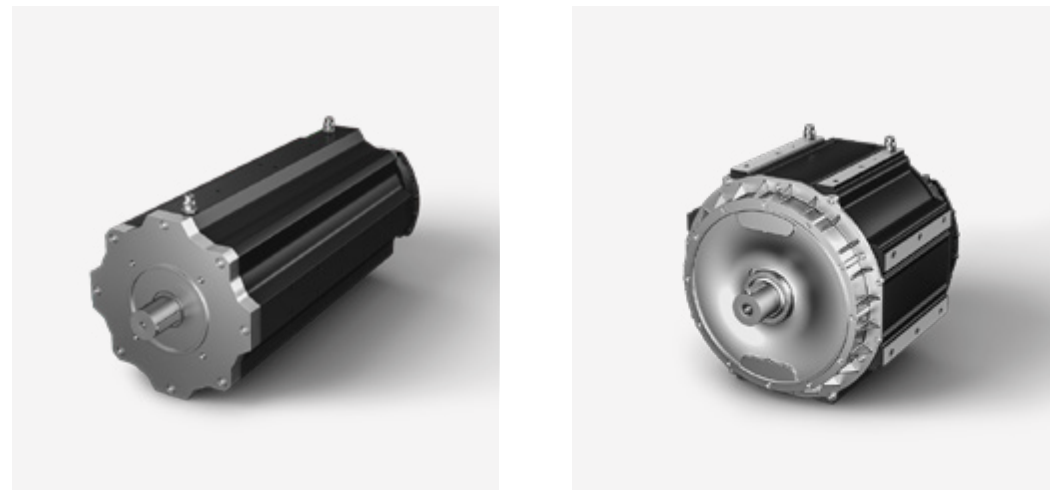
Training, commissioning
and more

| INVERTERS AND MOTORS

Hardware for propulsion
and functional drives

/ Overview

TRACTION MOTORS



**& MORE
AVAILABLE
PRODUCTS**



- AC-induction
- PM-reluctance

AUXILIARY MOTORS

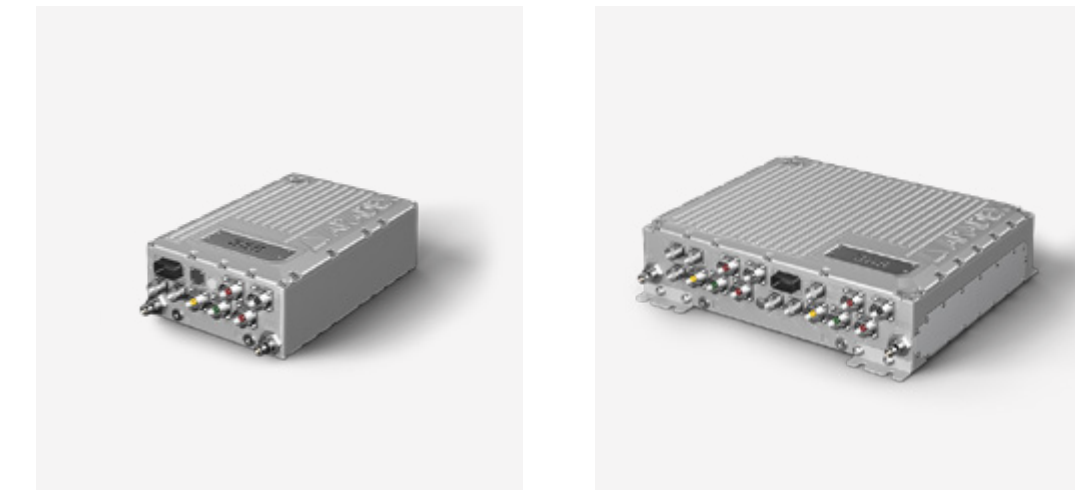


**& MORE
AVAILABLE
PRODUCTS**



- PM

MOBILE INVERTERS



**& MORE
AVAILABLE
PRODUCTS**



- Double
- Single

/ Motors & inverters combination

VECTOPOWER can operate up to 4 synchronized motors for up to 1200kW continuous power



Voltage range
300-840VDC



Continuous power
30-300kW



Peak torque
360-4000Nm

Our VECTOPOWER inverters support different motor topologies:

- AC-induction
- PM
- PM-reluctance

/ Traction motors

PM-reluctance type



High efficiency

VECTOPOWER inverter allows optimum use of reluctance based torque contribution



Compact design

Comparatively small space requirement in the vehicle as well as lower weight



High dynamics

Useful for fast synchronization during operation with switchable gearboxes

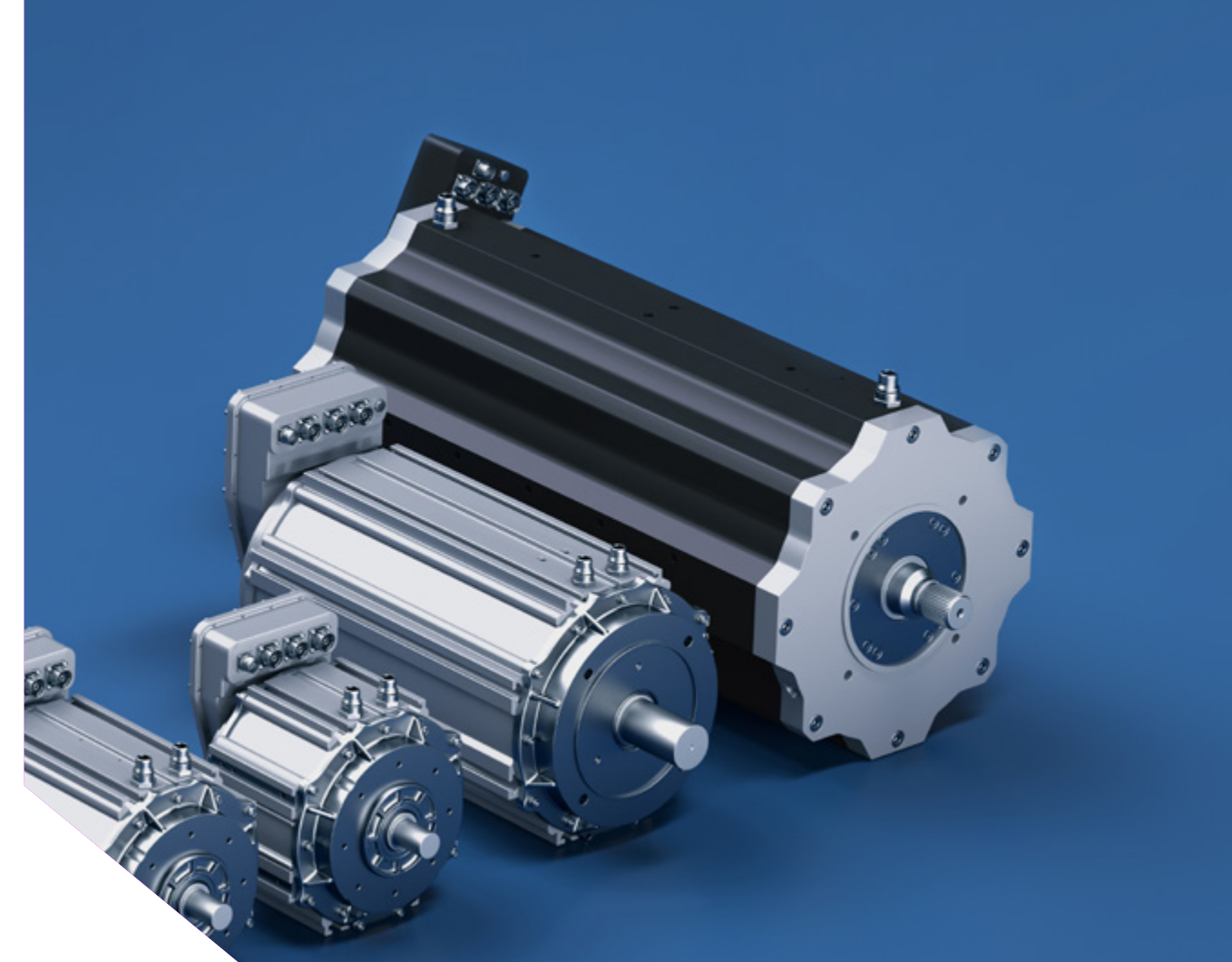


Suitable inverters

ARADEX offers perfect matching inverters and control software for pm-reluctance motors

/ Traction motors

AC induction type



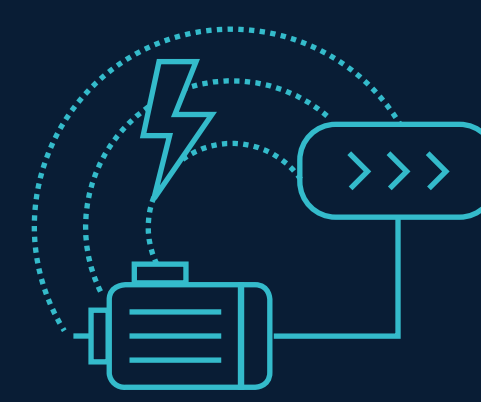
Maintenance-friendly

Maintenance work does not have to be carried out in a specialized workshop



Easy integration

No torque and no generated voltage in towing operation



Direct drive solutions

ARADEX offers solutions for propulsion with and without gearboxes



Suitable inverters

ARADEX offers perfect matching inverters and control software for asynchronous motors

/ Traction motors

Product overview



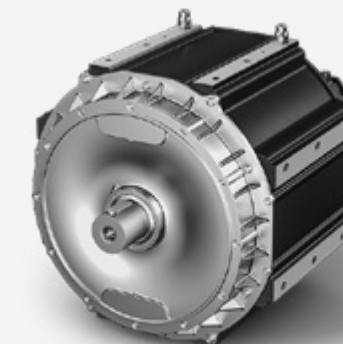
VM616-18W0040
PM-reluctance



VM600M-18W0073
PM-reluctance



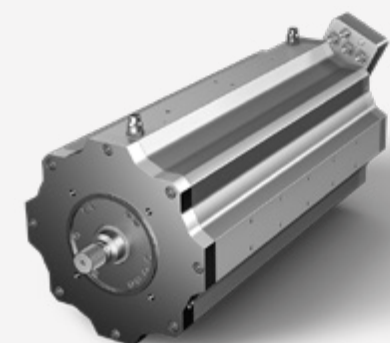
VM616-18W0120
PM-reluctance



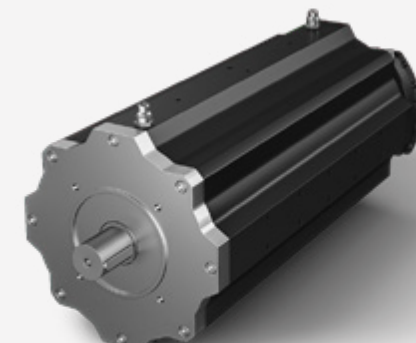
VM600M-28W0350
PM-reluctance



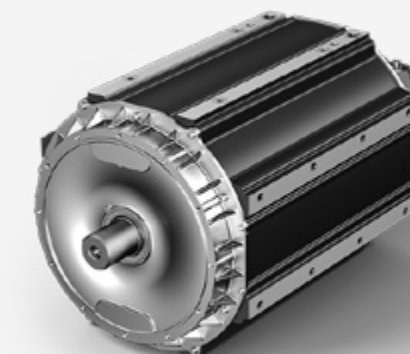
VM616-18W0044
AC-induction



VM620-18W0134
AC-induction



VM600M-18W0270
AC-induction



VM630-28W0380
AC-induction

/ Traction motors & inverters

Product data

Motor Name	Combined Inverter	Motor Topology	Peak Torque [Nm]	Cont. Torque [Nm]	Nom. Speed [rpm]	Max. Speed [rpm]	Main Applications, Remarks	Continuous Power Motor + Inverter [kW]
VM616-18W0040	VP600-18W340, VP600-28W344	PM-reluctance	360	175//110	3580//6000	7200//7200	High speed PM	65//69
VM616-18W0040	VP600-18W330, VP600-28W333	PM-reluctance	168	100//100	3580//6000	7200//7200	High speed PM	37//62
VM616-18W0044	VP600-18W340, VP600-28W344	AC-induction	440	179	2510//--	5800//--	High speed AC	47//--
VM616-18W0044	VP600-18W330, VP600-28W333	AC-induction	184	109	2510//--	5800//--	High speed AC	28//--
VM600M-18W0073	VP600-28W344, VP600-18W360	PM-reluctance	800	410//320	2150//3490	5200//6500	Direct cardan/gearbox	92//116
VM600M-18W0073	VP600-18W340	PM-reluctance	800	334//320	2150//3490	5200//6500	Direct cardan/gearbox	75//116
VM616-18W0120	VP600-18W360	PM-reluctance	1200	615//520	1530//2485	3200//4500	Direct cardan	98//135
VM616-18W0120	VP600-28W344	PM-reluctance	1200	593//520	1530//2485	3200//4500	Direct cardan	94//135

Values for **400VDC** // **650VDC**

Please contact our sales team for detailed information and data sheets

/ Traction motors & inverters

Product data

Motor Name	Combined Inverter	Motor Topology	Peak Torque [Nm]	Cont. Torque [Nm]	Nom. Speed [rpm]	Max. Speed [rpm]	Main Applications, Remarks	Continuous Power Motor + Inverter [kW]
VM616M-18W0120	VP600-18W340	PM-reluctance	1200	485//485	1530//2485	3200//4500	Direct cardan	77//126
VM620-18W0134	VP600-18W360	AC-induction	1340	600//600	1200//1950	4800//4800	Direct cardan	75//122
VM620-18W0134	VP600-28W344	AC-induction	1257	600//600	1200//1950	4800//4800	Direct cardan	75//122
VM620-18W0134	VP600-18W340	AC-induction	1257	502//502	1200//1950	4800//4800	Direct cardan	62//102
VM600M-18W0270	VP600-18W368	AC-induction	2700	804	--//2380	--//4800	Direct cardan	--//200
VM600M-28W0350	VP600-18W368	PM-reluctance	3800	1660	--//1210	--//3600	Direct cardan	--//210
VM630-28W0380	VP600-18W368	AC-induction	4050	1650	--//1385	--//3600	Direct cardan	--//239

Values for **400VDC** // **650VDC**

Please contact our sales team for detailed information and data sheets

/ Auxiliary motors

Permanent magnet type



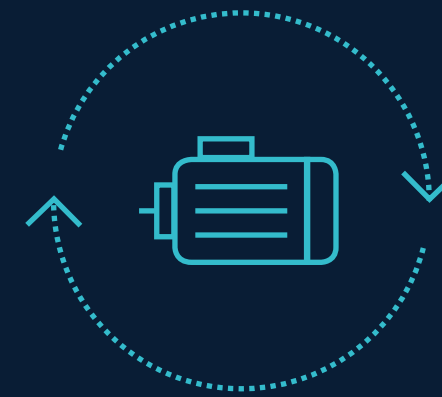
High peak-torques

High peak-torques for best overload-capability



Convection cooling

2 motors with natural convection cooling, easy to integrate



High continuous power

2 motors with higher continuous power by liquid cooling

/ Auxiliary motors

Product overview



/ Auxiliary motors & inverters

Product data

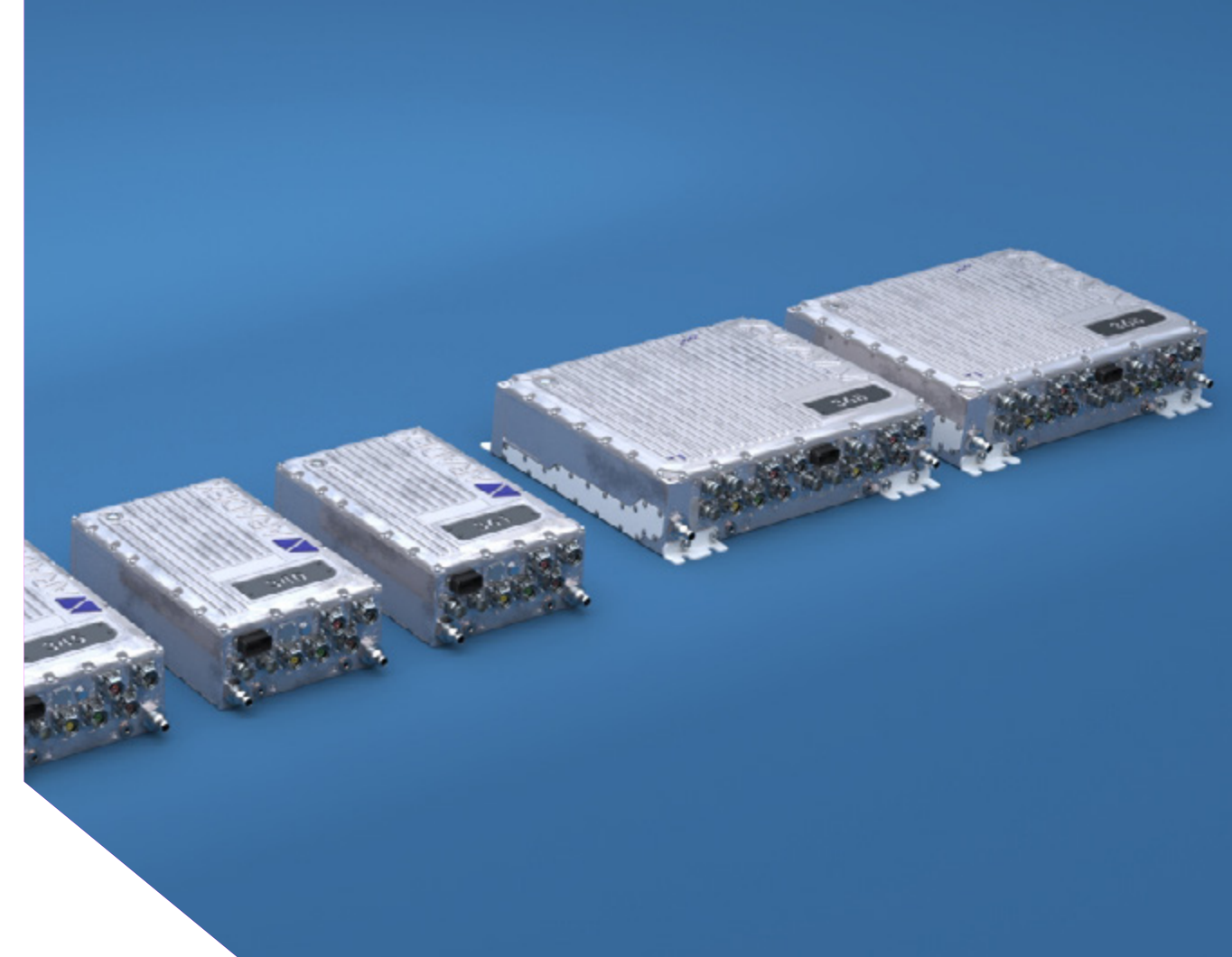
Motor Name	Combined Inverter	Motor Topology	Peak Torque [Nm]	Cont. Torque [Nm]	Nom. Speed [rpm]	Max. Speed [rpm]	Main Applications, Remarks	Continuous Power Motor + Inverter [kW]
VM600M-18W0018	VP600-18W330, VP600-18W333, VP600-18W340, VP600-28W344	PM	221	72	2140//3000	2850//4000	Auxiliary, liquid + convection	16//22,6
VM600M-18Z0012	VP600-18W330, VP600-18W333, VP600-18W340, VP600-28W344	PM	221	32	2140//3000	2850//4000	Auxiliary, convection cooled	7//10
VM600M-18Z0027	VP600-18W340, VP600-28W344	PM	328	52	2140//3000	2850//4000	Auxiliary, convection cooled	11,6//6,3
VM600M-18Z0027	VP600-18W330, VP600-28W333	PM	232	52	2140//3000	2850//4000	Auxiliary, convection cooled	11,6//6,3
VM600M-18W0027	VP600-18W340, VP600-28W344	PM	328	100	2140//3000	2850//4000	Auxiliary, liquid + convection	22,4//31,4
VM600M-18W0027	VP600-18W330, VP600-18W333	PM	232	100	2140//3000	2850//4000	Auxiliary, liquid + convection	22,4//31,4

Values for **400VDC** // **650VDC**

Please contact our sales team for detailed information and data sheets

/ Mobile inverters

Reliable and robust inverters for mobile applications:
Single and double versions, up to 900Arms peak.



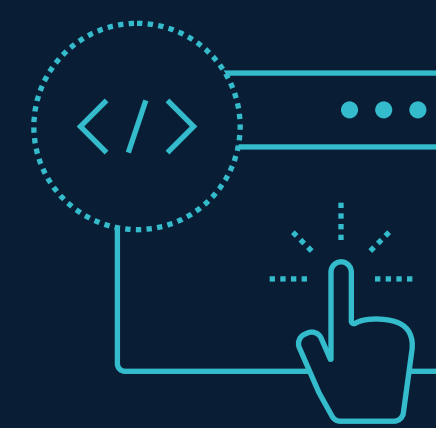
Robust and reliable

For optimum performance and long working life even with demanding cyclic loads



Functional safety

Series 3 integrates STO as per DIN EN 61800-5-2:2017, EN ISO 13849-1:2015, EN 62061:2005/A2:2015



MCU runtime integrated

Free programming with VECTOSTUDIO or use of ready-made function modules



Usability

Comes with ready-made operating modes, diagnostic and protective functions

/ Mobile inverters

Product overview



Single inverters
3 phase

- VP600-18W330
- VP600-18W340
- VP600-18W360
- VP600-18W361



Single inverters
3/6 phases

- VP600-18W368
- VP600-18W369



Double inverters
2*3 phase

- VP600-28W333
- VP600-28W344
- VP600-28W345

/ Mobile inverters

Product data

Inverter Name	Single / Double	Cont. current	10-min current	10-s current	Max PWM	Max electrical frequency
VP600-18W330	Single	95 Arms	105 Arms	160 Arms	8 kHz	599 Hz
VP600-28W333	Double	2 * 95 Arms	2 * 105 Arms	2 * 160 Arms	8 kHz	599 Hz
VP600-18W340	Single	180 Arms	280 Arms	450 Arms	8 kHz	599 Hz
VP600-28W344	Double	2 * 220 Arms	2 * 300 Arms	2 * 450 Arms	8 kHz	599 Hz
VP600-28W345	Double	2 * 220 Arms	2 * 300 Arms	2 * 450 Arms	16 kHz	1999 Hz
VP600-18W360	Single	250 Arms	350 Arms	525 Arms	8 kHz	599 Hz
VP600-18W361	Single	250 Arms	350 Arms	525 Arms	16 kHz	1999 Hz
VP600-18W368	Single	440 Arms	600 Arms	900 Arms	8 kHz	599 Hz
VP600-18W369	Single	440 Arms	600 Arms	900 Arms	16 kHz	1999 Hz

Please contact our sales team for detailed information and data sheets

/ Mobile inverters for marine applications

Product data

Inverter Name	Single / Double	Cont. current	60-s current	10-s current	Max PWM	Max electrical frequency
VP600-18W268	Single	440 Arms	680 Arms	900 Arms	6 kHz	599 Hz
VP600-18W160-HP	Single	275 Arms	400 Arms	520 Arms for 1s	16 kHz	599 Hz
VP600-18W140-HP	Single	250 Arms	340 Arms	450 Arms	6 kHz	599 Hz
VP600-28W244	Double	2 * 220 Arms	2 * 340 Arms	2 * 400 Arms	8 kHz	599 Hz
VP600-28W233	Double	2 * 85 Arms	2 * 105 Arms	2 * 145 Arms	12 kHz	599 Hz

Please contact our sales team for detailed information and data sheets



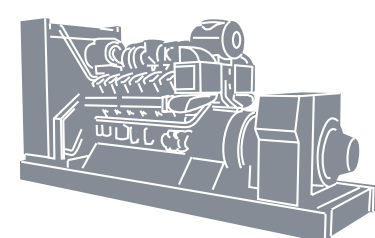
MULTI-ENERGY-CONCEPT

Battery, fuel cell, diesel-hybrids:
Starting now and future proof

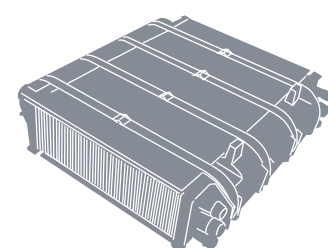
/ Future Proof Solution

Multi-Energy-Concept

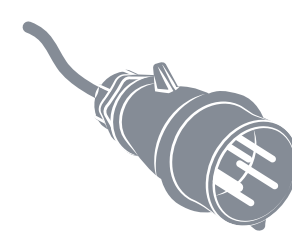
ENERGY SOURCE (Multi-Energy)



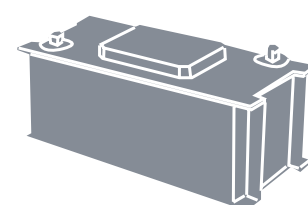
Generator



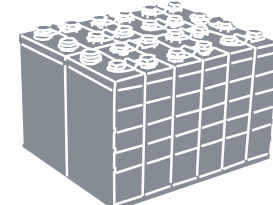
Fuel cell



Cable

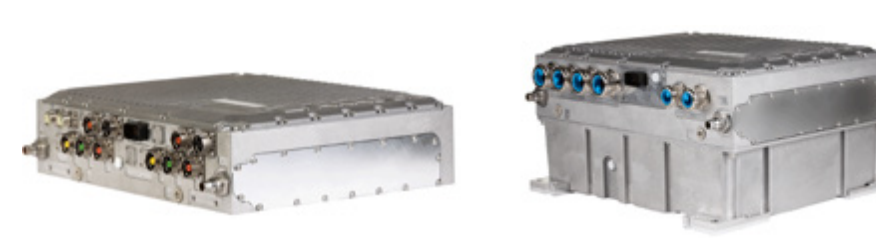


SuperCap

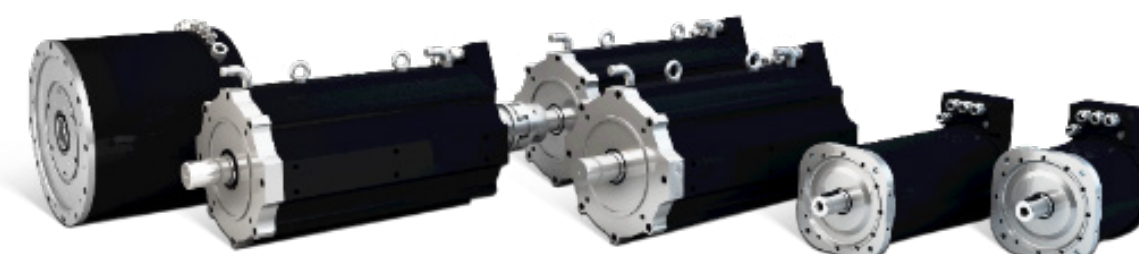


Battery

CONVERSION (Motors & Inverters)



Inverters + DC/DC (e.g. for fuel cell)



Permanent Magnet & Asynchronous

APPLICATION (Application Specific)

Perfect efficiency and power management via software in the inverters and DC/DCs:

Working machines

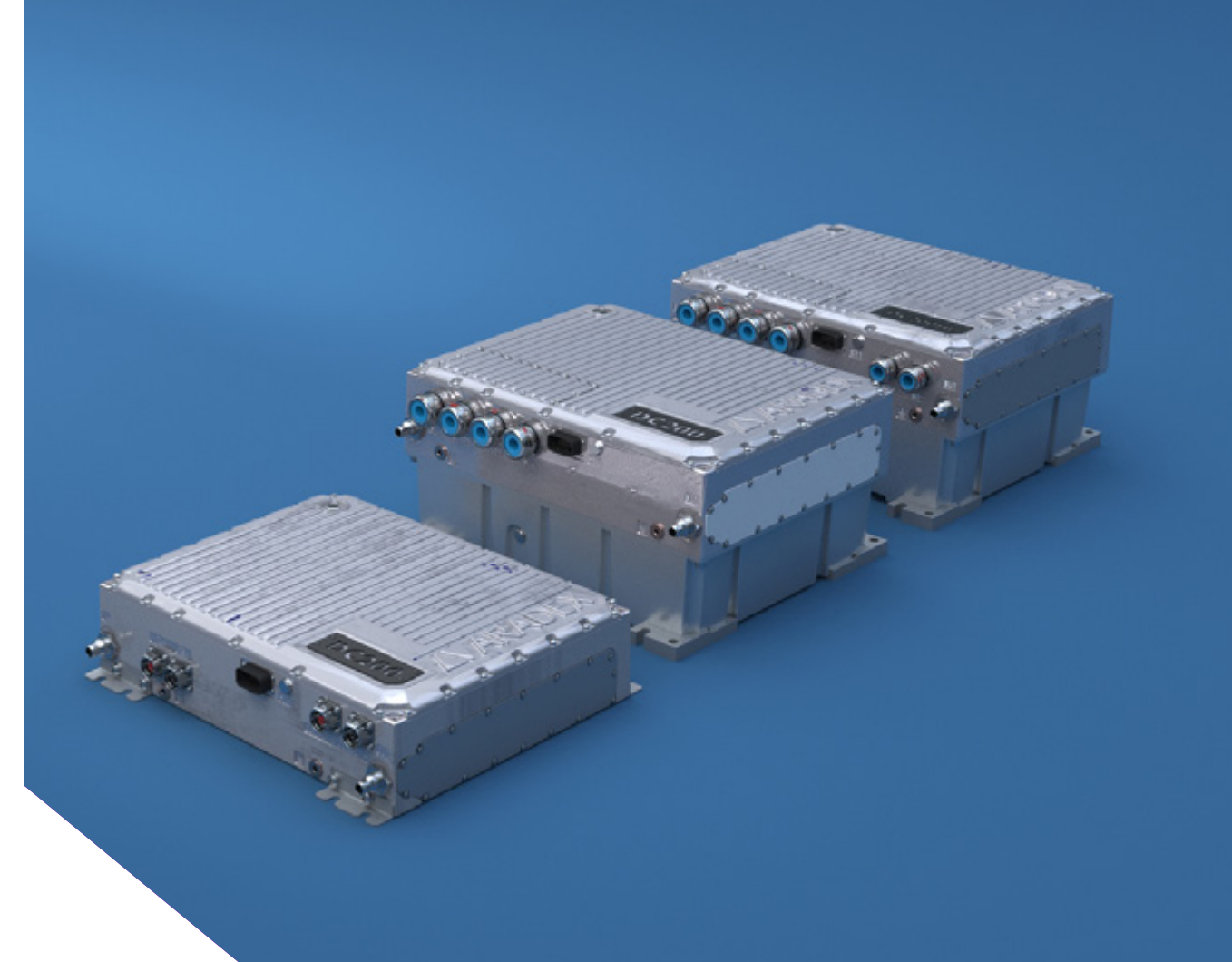
Commercial vehicles

Ships

Other applications

/ DC/DC converters

The VP5000 high-voltage DC/DC converters couple two different DC voltages bidirectionally with a high efficiency.



High efficiency

Highly efficiency-optimized, up to 99% depending on the point of of operating



Wide voltage range

Current up to 400A, voltage up to 770VDC (higher on demand)



For fuel cells / batteries

Optimized for coupling batteries or fuel cells to existing HV systems



More safety for fuel cells

Reliable protection against voltage ripple, operation always at the optimum operating point

/ DC/DC converters

Product overview



VP5000-DCDC60
e.g. for battery systems

- Max DC-voltage: 770V
- Cont. current LV side: 110ADC
- Max. continuous power: 60kW
- Bidirectional energy flow



VP5000-DCDC200
e.g. for fuel cells

- Max DC-voltage: 770V
- Cont. current LV side: 400ADC
- Max. continuous power: 200kW
- Bidirectional energy flow



VP5000-DCDC200-HL
e.g. for fuel cells

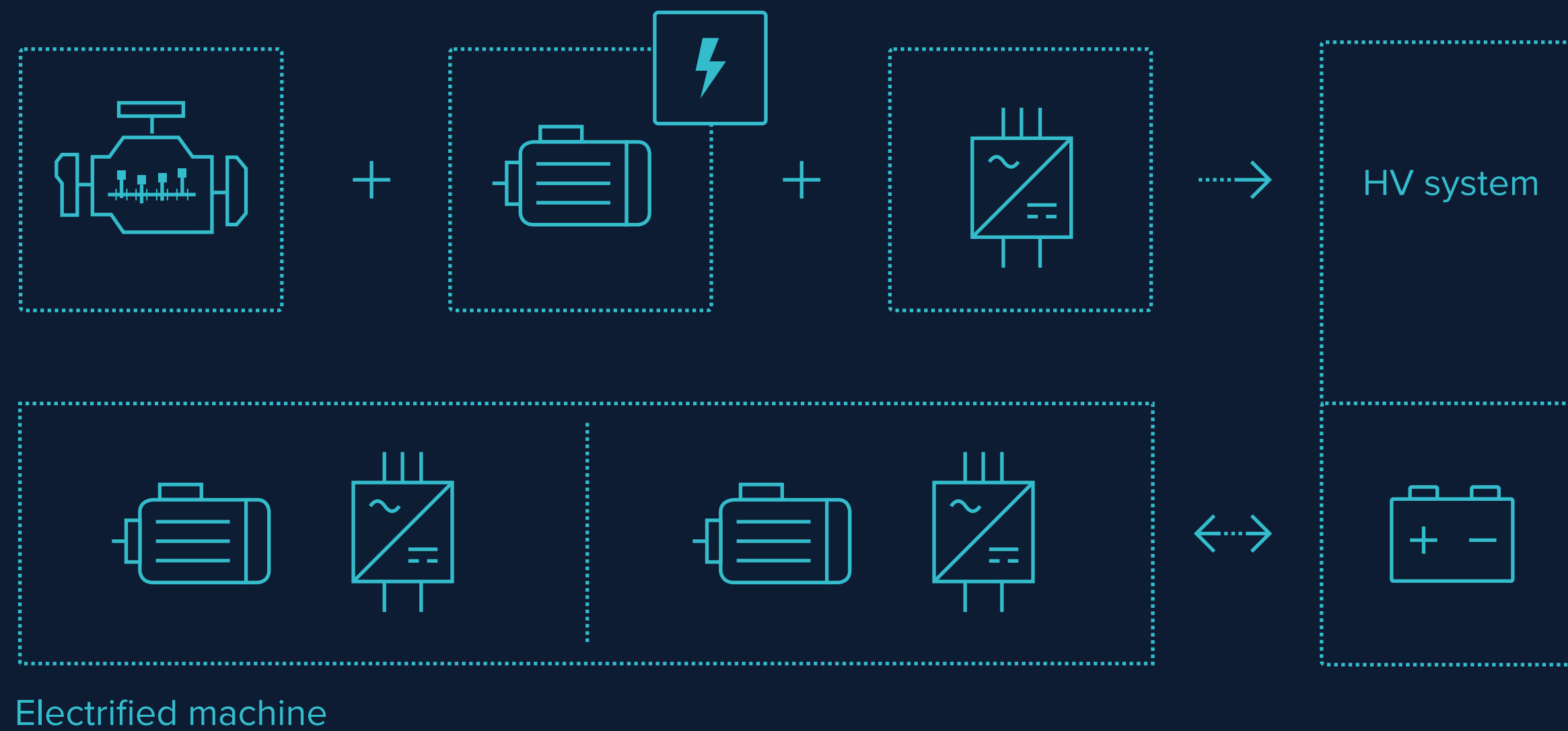
- Max DC-voltage: 770V
- Cont. current LV side: 400ADC
- Max. continuous power: 200kW
- Bidirectional energy flow
- Integrated brake chopper with max 200ADC



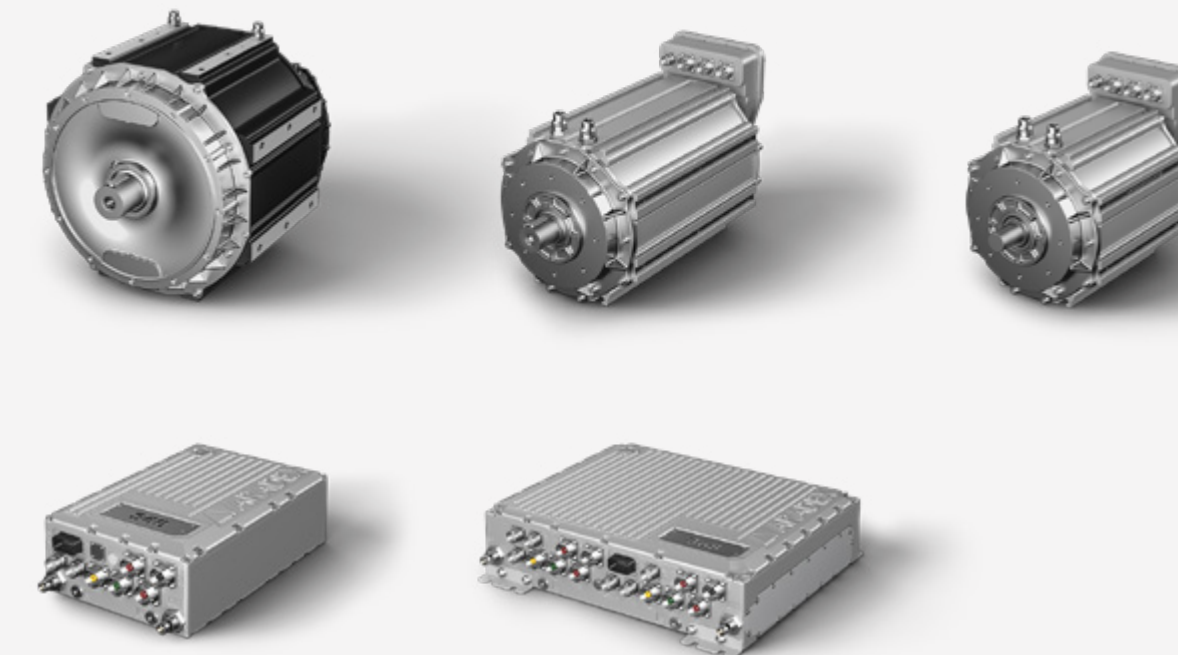
EXAMPLES

Components and subsystems:
Our market approach

/ Serial hybrid “RangeExtender”



Products available from ARADEX:



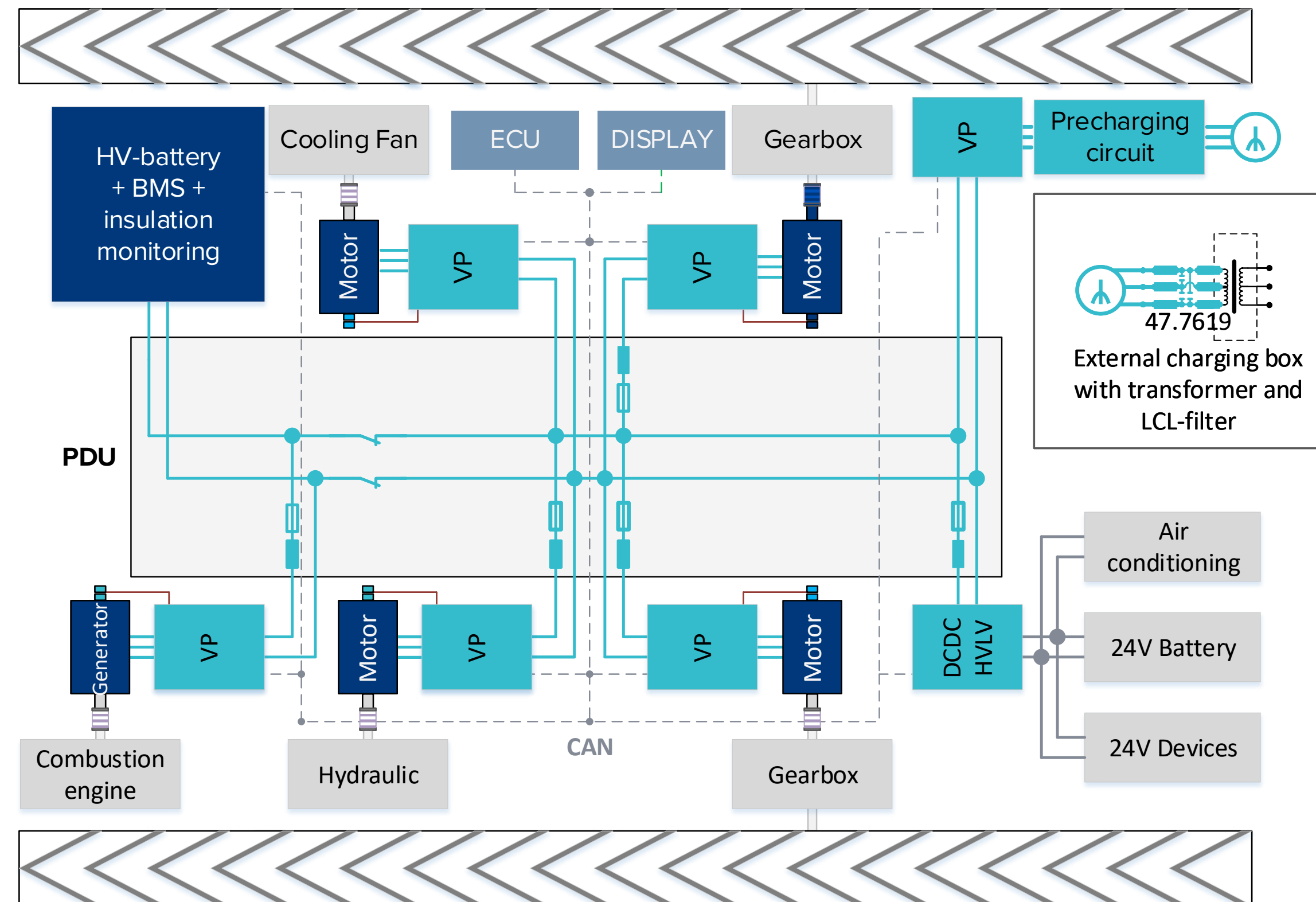
/ Serial hybrid

Electro-mechanical propulsion



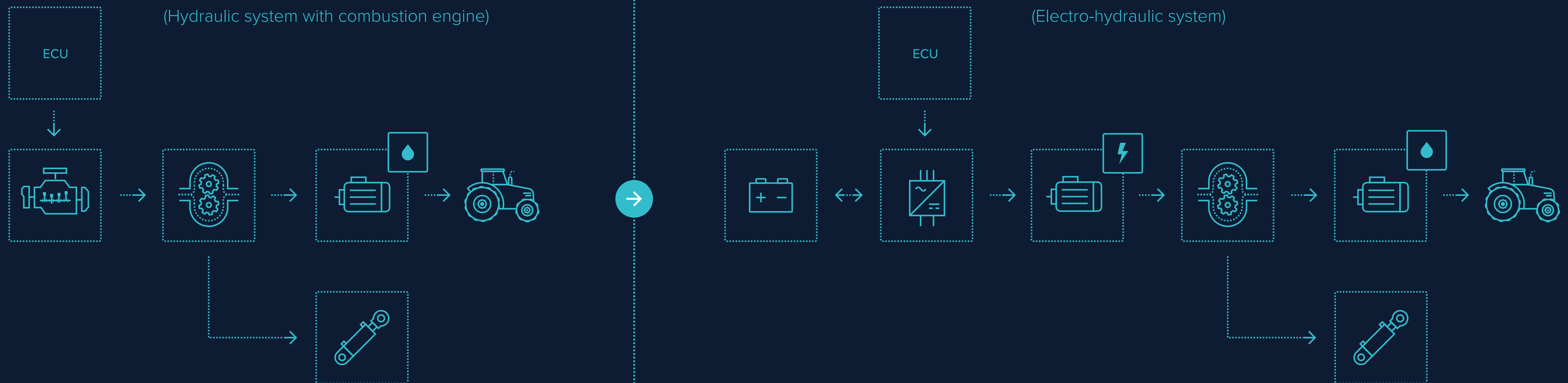
Functional block diagram of an electrified dozer with electromechanical chain propulsion

- Significant increased efficiency
- Improved driveability
- Fuel cell ready

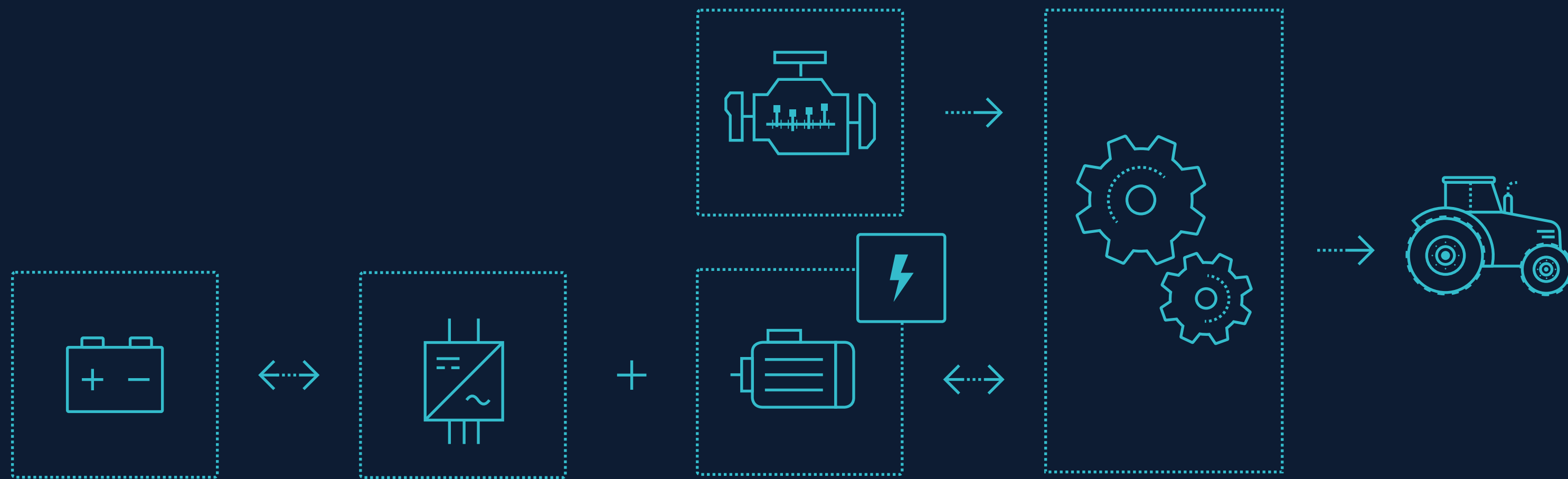


/ Serial hybrid

Electro-hydraulic propulsion



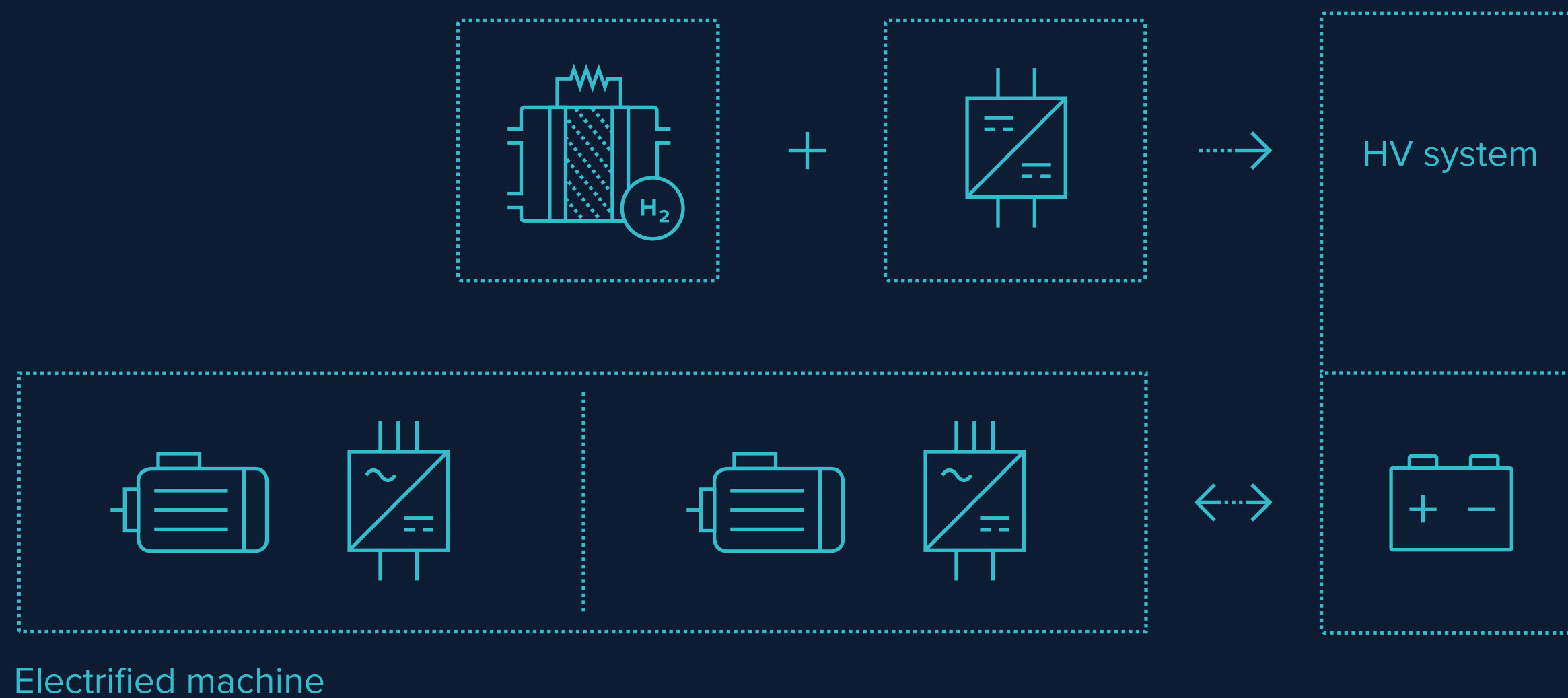
/ Parallel hybrid “E-boost”



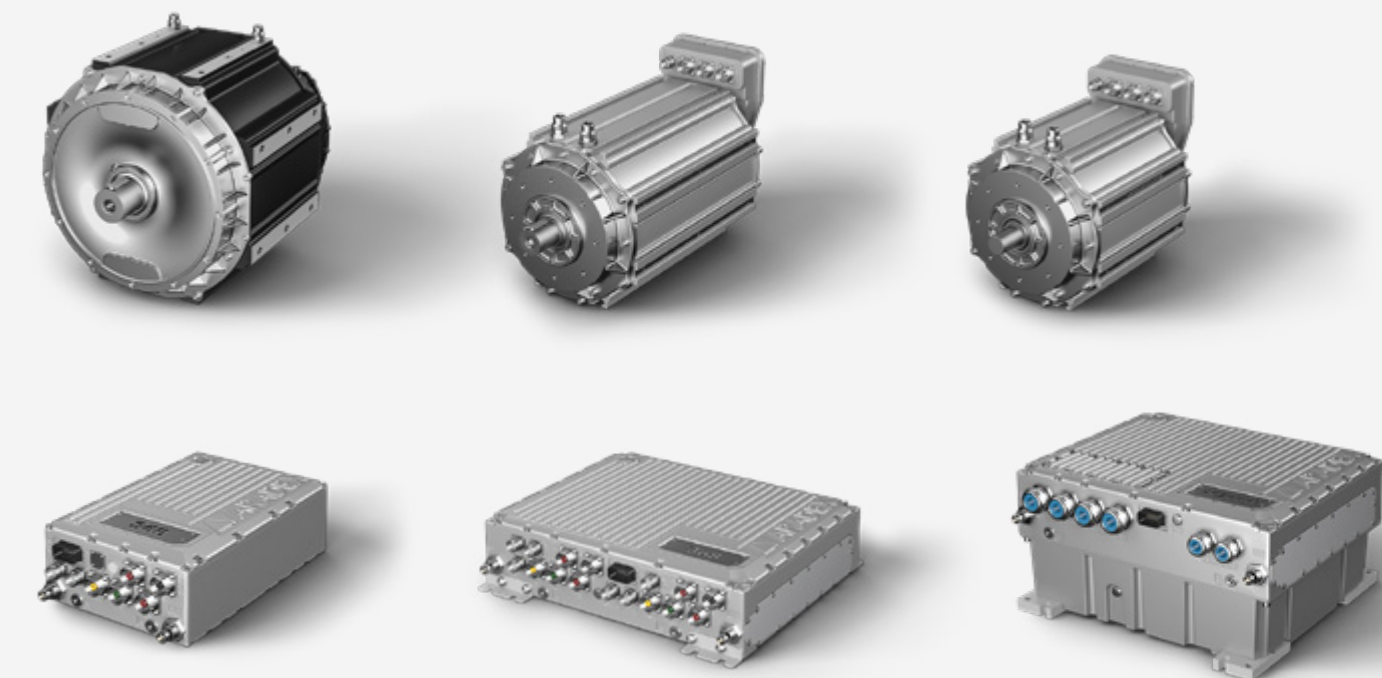
Products available from ARADEX:



/ Hydrogen-based Fuel cell as “RangeExtender”



Products available from ARADEX:



IV

ENGINEERING SUPPORT

Training, commissioning
and more

/ Our claim: Make things work!

Supporting you is our DNA. We create the perfect conditions to provide you comprehensive support in all project phases.



Our services

- + Support in dimensioning, components selection and feasible complete high-voltage solutions.
- + Training for products, programming, commissioning, diagnostics and dimensioning.
- + Creation of customer-specific software and technology modules.
- + Commissioning support both on site and digital, all over the world. Comprehensive diagnostic tools also for your teams.
- + Our after-sales offers service, maintenance and diagnostics, on site and digital.

/ Challenge us

Review of your application

Challenge us with your application, your demands and your ideas!


- + Our engineers can work out or support the project planning for your application.
- + You receive the result as an electronic document: cornerstones of your project regarding electrification or hybridization including dimensioning done by our experienced project engineers.
- + Contact our sales team for more information.

Thanks for your attention!


**Optimized usability
and performance
for the best e-mobility**



Challenge us with your application!

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