Hengli

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Empower with intelligence

Nanjing Hengli Intelligent Technology Co.,Ltd

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Empower with intelligence

▭ Off-road machinery solutions

▭ Product introduction

Advantages

Traction system: Quad-motor single ratio gearbox system provides continues torque output without need for gear-shifting. No gearbox needed, guarantee high reliability, better comfort and next level drivability;

MCU: High voltage 7in1 MCU + Dual-inverter solution gives high level of integration, ease full vehicle layout design;

VCU: Support Simulink/ C language, which offers more options and higher efficiency for users to program.

VCU
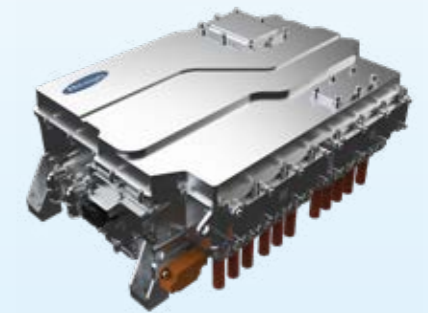
High voltage multi-in-one MCU

Quad-motor single ratio gearbox system

Dual-inverter

Advantages

Traction system: Dual-motor direct drive powertrain, provides continues torque-speed output without gearbox, offer high reliability, better comfort and next level drivability.
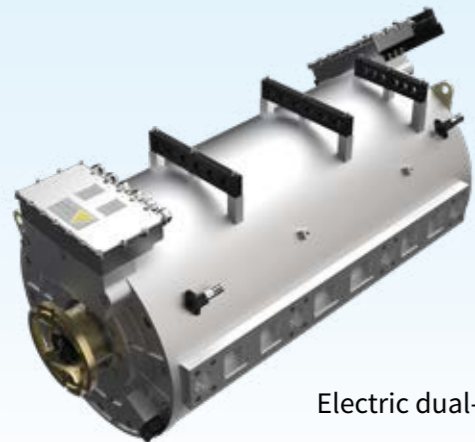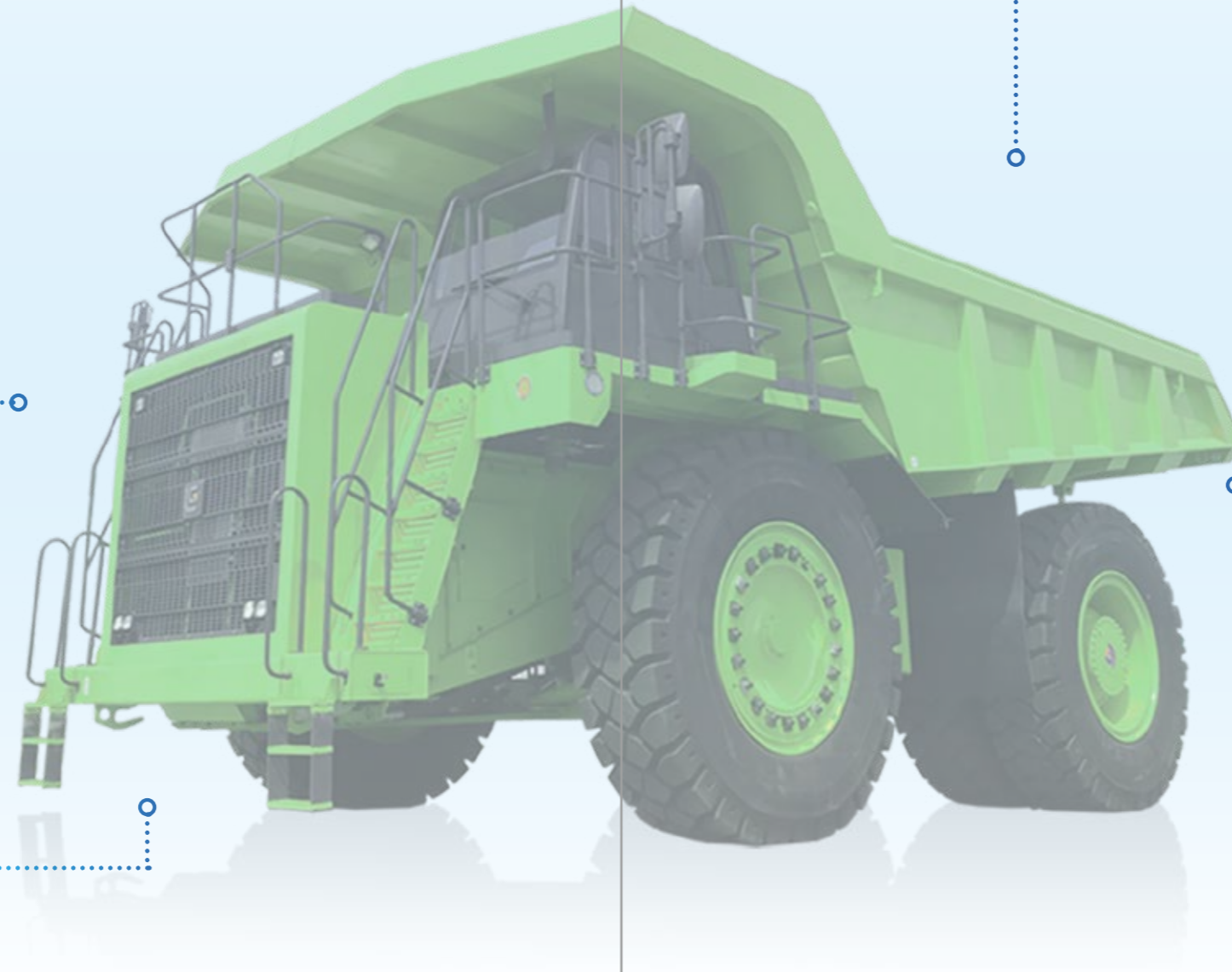
MCU: High voltage 5in1 MCU + Single inverter solution gives high level of integration, ease full vehicle layout design;

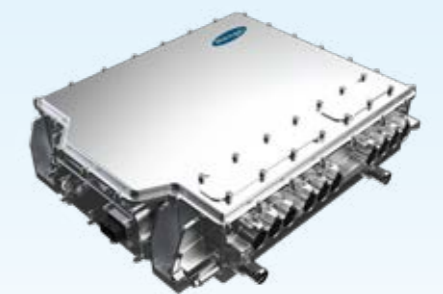**VCU:** Support Simulink/ C language, which offers more options and higher efficiency for users to program.

VCU
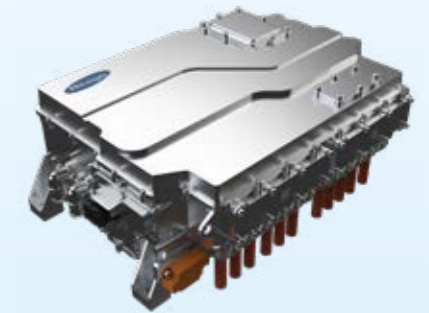
High voltage
multi-in-one MCU

Dual-inverter

Electric dual-motor

Advantages

High speed pump motor: Using oil-cooled hair-pin motor technology, gives higher power density and better efficiency.

MCU: High voltage multi-in-one MCU integrates electric pump motor inverter, DCDC and PDU. Customizable IGBT modules (600/800/1000A), maximizing performance with optimal cost.

VCU: Support C language/ Codesys 3.5 or Simulink, which offers more options and higher efficiency for users to program.

High voltage multi-in-one MCU

High speed pump motor

VCU
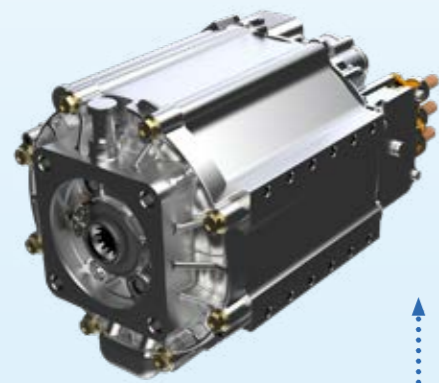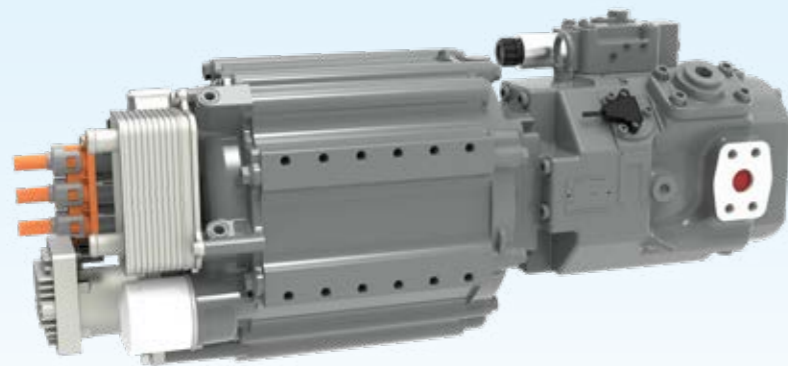
Electric motor + High speed pump
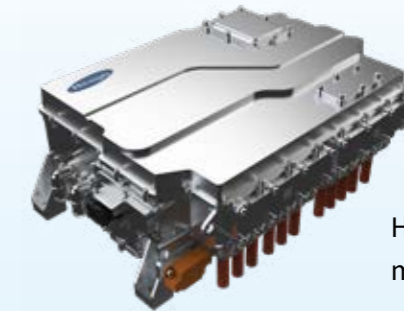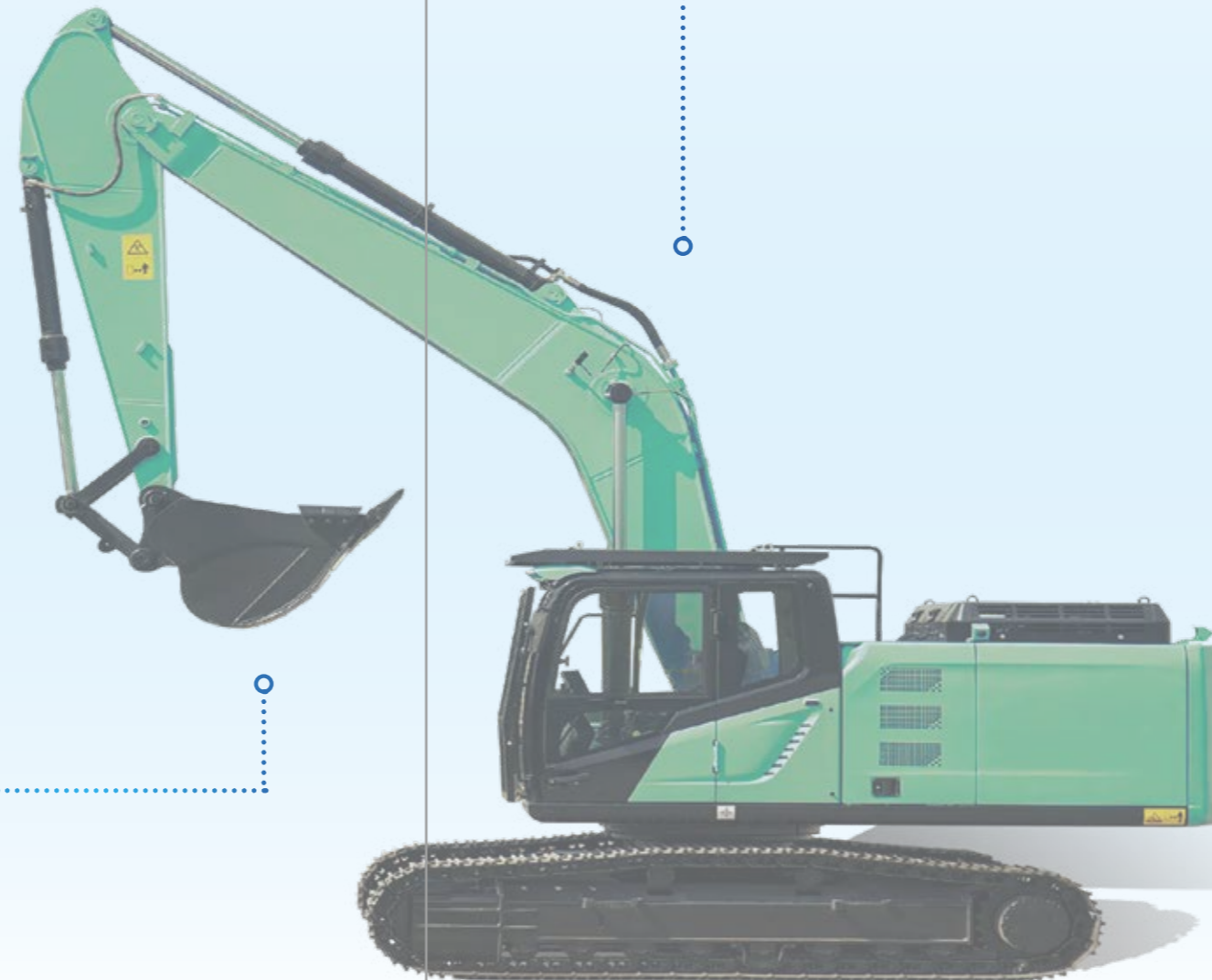
Advantages

MCU: High voltage multi-in-one MCU integrates inverters for both hydraulic and traction system, ease full vehicle layout design, reduce cost.

VCU: Support C language/ Codesys 3.5 or Simulink, which offers more options and higher efficiency for users to program.

VCU
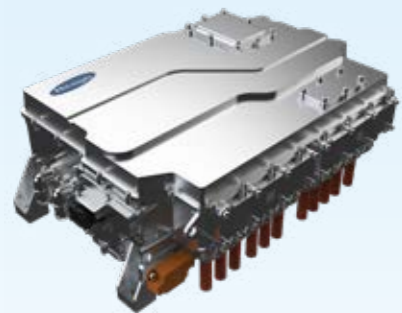
High voltage
multi-in-one MCU
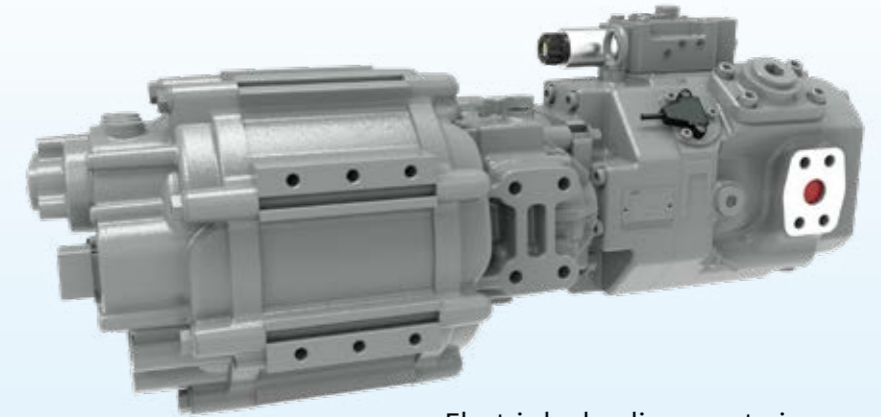
Electric hydraulic powertrain
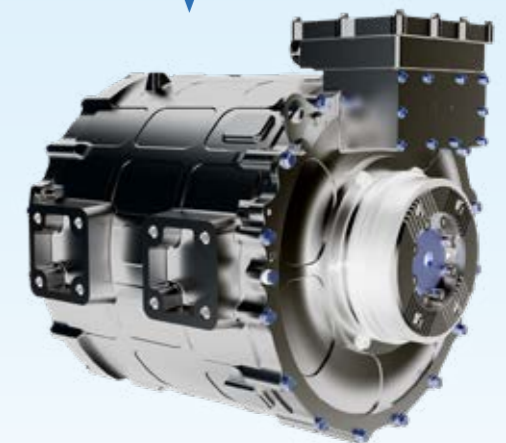
Electric traction motor

Advantages

MCU: High voltage multi-in-one MCU integrates inverters for both hydraulic and traction system. Customizable IGBT modules (600/800/1000A), maximizing performance with optimal cost.

VCU: Support C language/ Codesys 3.5 or Simulink, which offers more options and higher efficiency for users to program.

Electric traction motor

High voltage
multi-in-one MCU

Electric motor for
hydraulic system

VCU
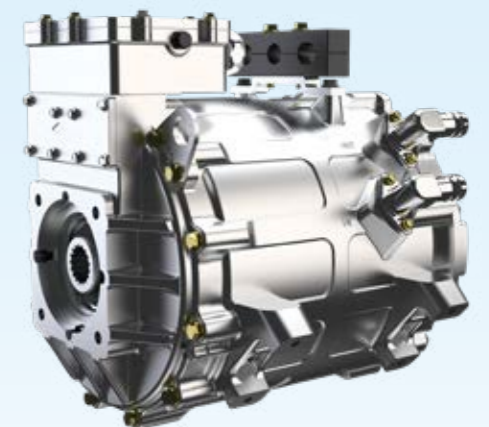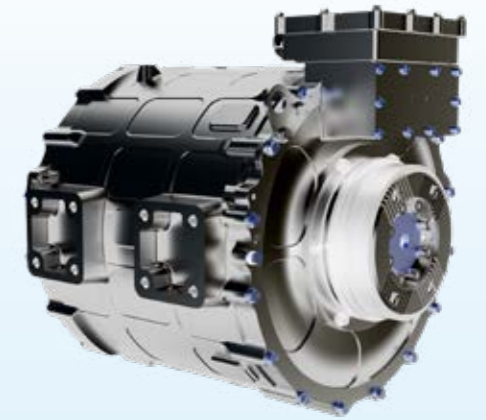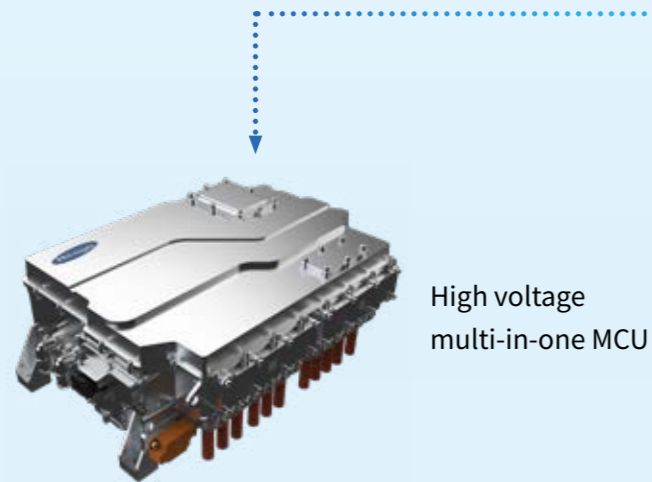
Advantages

Product suitable for 24V~80V MEWP lift platforms;

Multiple types of products: Single/Dual/3in1/PMSM integrated solution;
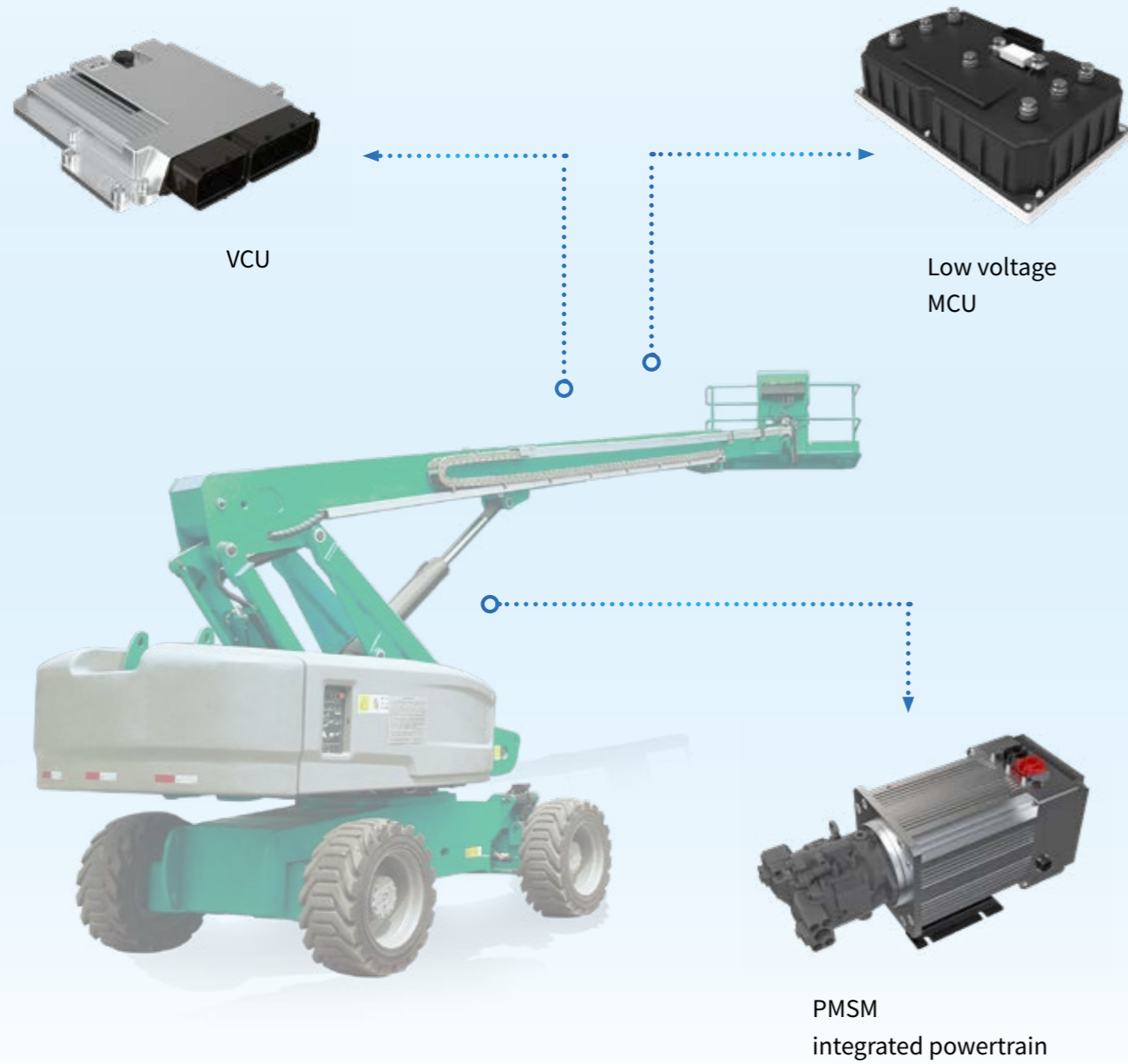
Safety: Conforming to EN ISO 13849 Functional safety standard, reaching PLd level.

VCU

Low voltage MCU

PMSM integrated powertrain

Low voltage MCU

PMSM integrated powertrain
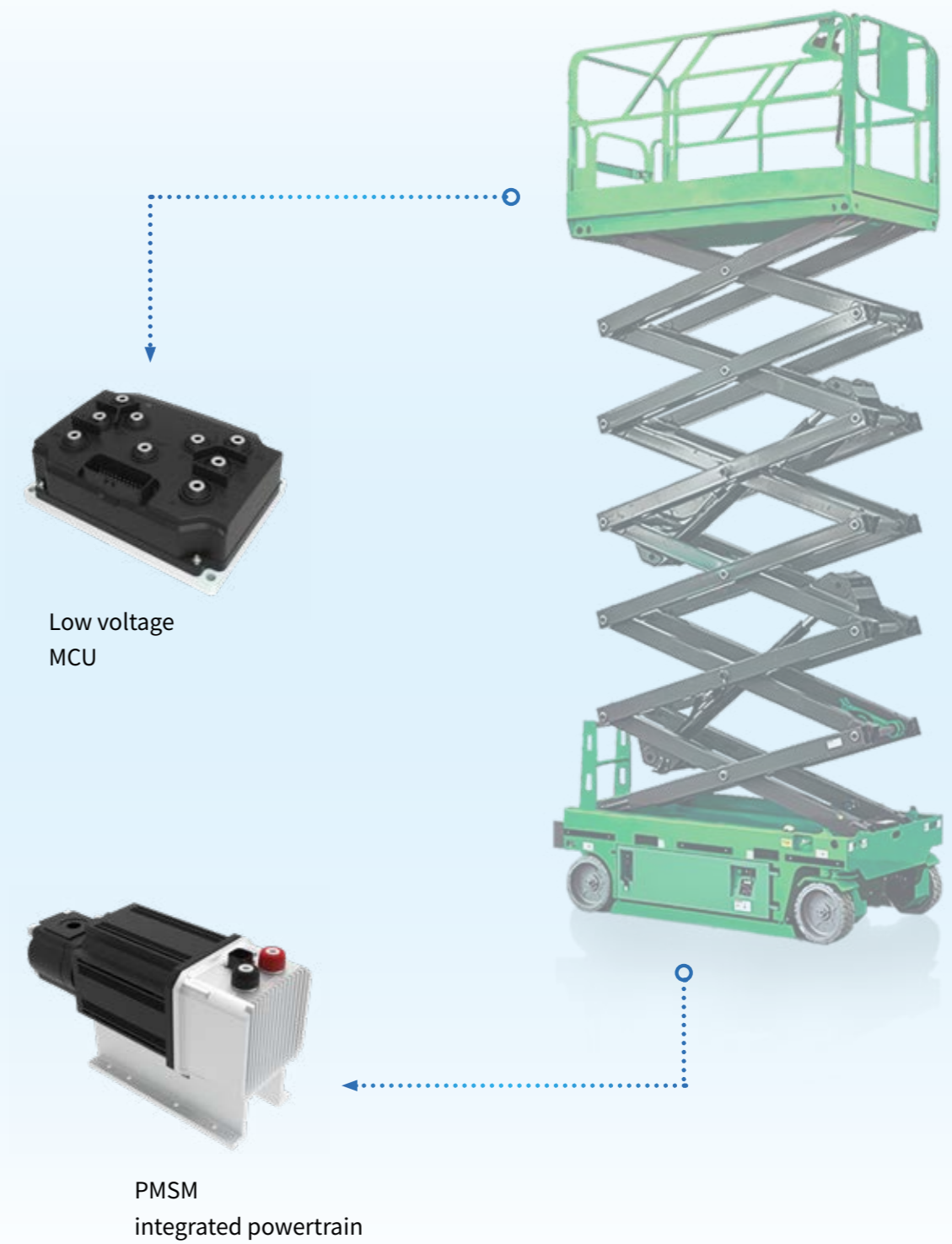
Advantages

VCU: Support C language/ Codesys 3.5 or Simulink, which offers more options and higher efficiency for users to program.
Contain excessive IO resources, including multiple software-configurable multi-use ports, one solution for various applications;
Offer comprehensive diagnostics and self-protection functions, simplify debugging, enhance reliability.

Functional safety controller
HLEC-C2-3532

Universal controller
HLEC-C1-7450

Functional safety controller
HLEC-C3-7053
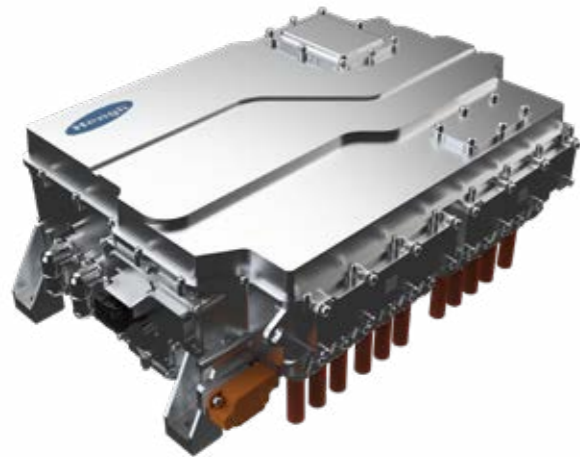
Introduction

The HLEC-MC-I Series high voltage multi-in-One MCU, developed by Hengli with 30 years of off-road machinery expertise, integrates MCU×3, DCAC×2, DCDC, and PDU modules. It features high integration, power density, efficiency, vibration resistance, and reliability.

Applications

| Loader | Excavator | Mining dump truck | Widebody mining truck | Empty container handler | Reach stacker | Heavy-duty forklift |

General specifications

Operating voltage VDC	400-750V
Rated voltage VDC	600V
Operating temperature	－ 40℃～ +85℃
IP rating	IP67
Operation altitude	≤ 5500m
Size	675×501×266mm

Technical specifications

Traction MCU	Option 1	Option 2
Rated output power	250kW+125kW	125kW（x3）
Peak output power	400kW+250kW@60s	250kW@60s（x3）
Rated output current	470A+280A	280A（x3）
Peak output current	850A+560A@60s	560A@60s（x3）
Efficiency	≥ 99%	≥ 99%

DCDC	Option 1	Option 2
Rated output power	4.5kW	6kW
Peak output power	5kW	6.6kW

DCAC	Option 1	Option 2
Rated output power	7.5kW	10kW
Peak output power	15kW	22kW

Introduction

The HLEC-MC Series high voltage MCU, developed by Hengli with 30 years of off-road machinery expertise, integrates MCU and PDU modules. It features high integration, power density, efficiency, vibration resistance, and reliability.

Applications

Widebody mining truck	Mining dump truck	Reach stacker	Empty container handler	Heavy-duty forklift
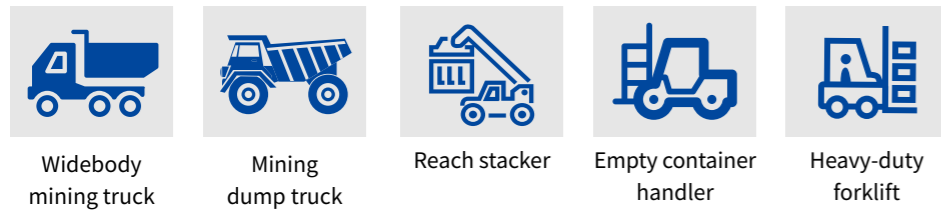
General specifications

Operating voltage VDC	400-750V
Rated voltage VDC	600V
Operating temperature	— 40℃～ +85℃
IP rating	IP67
Operation altitude	≤ 5500m
Size	646×533×168mm

Technical specifications

Traction MCU	Option 1	Option 2	Option 3	Option 4
Rated output power	250kW	360kW	125kW（x2）	150kW（x2）
Peak output power	400kW@60S	500kW@60S	250kW@60S（x2）	300kW@60S（x2）
Rated output current	470A	600A	280A（x2）	325A（x2）
Peak output current	850A@60S	1120A@60S	560A@60S（x2）	650A@60S（x2）
Efficiency	99%	99%	99%	99%
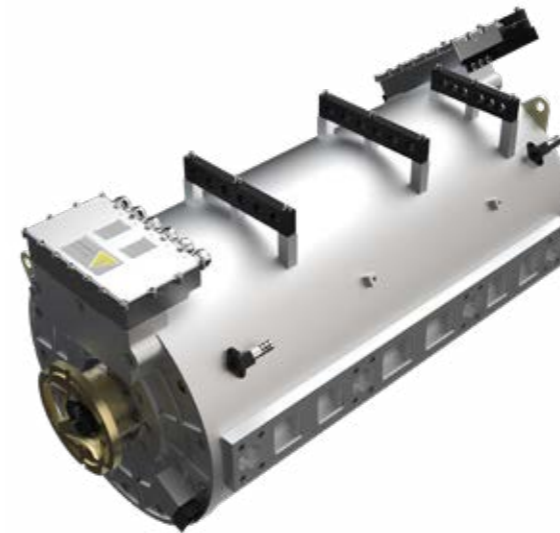
Introduction

The HLEC-TZ530XS-001 is a low-speed, high-torque permanent magnet synchronous motor for direct drive system, features high output torque, efficiency, and reliability.

Applications

Mining dump truck

Technical specifications

Electric motor specifications	
PMSM	PMSM (Permanent magnet synchronize motor)
Rated voltage	630VDC
Peak power	800kW
Rated power	500kW
Peak torque	15000Nm
Rated torque	4600Nm
Peak speed	3000rpm
Rated speed	1050rpm
IP rating	IP67

Introduction

The HLEC-TZ530XS-003 is a low-speed, high-torque permanent magnet synchronous motor for direct drive system, features high output torque, efficiency, and reliability.

Applications

Loader

Excavator

Introduction

The HLEC-ST-02-A features a quad-motor direct drive with a reduction gear, eliminating the high failure rate associated with gear shifting. It offers fast uphill climbing ability under heavy load, offering high operational efficiency.

Applications

Widebody mining truck

Technical specifications

Electric motor specifications	
PMSM	PMSM (Permanent magnet synchronize motor)
Rated voltage	630VDC
Peak power	400kW
Rated power	250kW
Peak torque	7500Nm
Rated torque	2300Nm
Peak speed	3000rpm
Rated speed	1050rpm
IP rating	IP67

Technical specifications

Electric motor specifications	
PMSM	PMSM (Permanent magnet synchronize motor)
Rated voltage	600VDC
Peak power	250kW×4
Rated power	150kW×4
Peak torque	1250Nm×4
Rated torque	550Nm×4
Peak speed	12000rpm
Rated speed	2600rpm
IP rating	IP67
Gearbox specifications	
Transmission ratio	3.967
Input torque	5000Nm
Input speed	12000rpm

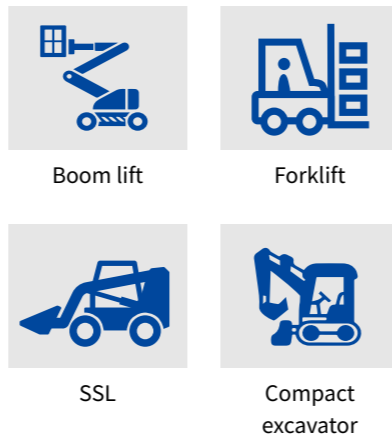## Introduction

The HLEC-AC Series offers multiple models of low-voltage motor controller designed specifically for construction machinery, conforming to EN ISO 13849 PLd. Suitable for various voltage platforms from 24V to 96V and features comprehensive diagnostic and self-protection functions. Utilizing vector control algorithms, it offers fast response. Products are compatible with various motor types, while providing high protection and reliability.

General specifications

Operating temperature		-40~55°C
Storage temperature		-40~85°C
Environmental test	Rapid temperature change	GB/T 2423.22
	Damp heat	GB/T 2423.3
	Neutral salt spray	GB/T 2423.17
Mechanical test	Sinusoidal wave vibration	GB/T 2423.10
	Sine Sweep	GB/T 2423.56
	Mechanical impact	GB/T 2423.5
EMC	Electromagnetic radiation	GB/T 30031
	Electro magnetic interference	GB/T 17799-2
	Electrostatic discharge	GB/T 17626-2
Insulation rating		500V
IP level		IP67

Applications

Boom lift   Forklift

SSL   Compact excavator

Technical specifications

Model	Type	Rated input voltage	Operating voltage	Output current		
					S2-2min	S2-2min (DC)
HLEC-AC1-24-250	Single-motor controller	24	12~35V	130A	250A	-
HLEC-AC1-D-24-200	Dual-motor controller	24	12~35V	80A	200A	-
HLEC-AC1-T-24-200-280	3in1 motor controller	24	12~35V	80A	200A	280A
HLEC-AC1-48-375	Single-motor controller	48	14.4~63V	155A	375A	-
HLEC-AC1-48-450	Single-motor controller	48	14.4~63V	175A	450A	-
HLEC-AC1-48-550	Single-motor controller	48	14.4~63V	225A	550A	-
HLEC-AC1-48-650	Single-motor controller	48	14.4~63V	260A	650A	-
HLEC-AC1-D-48-250	Dual-motor controller	48	14.4~63V	94A	250A	-
HLEC-AC1-T-48-250-250	3in1 motor controller	48	14.4~63V	94A	250A	250A
HLEC-AC1-D-48-375	Dual-motor controller	48	14.4~63V	155A	375A	-
HLEC-AC1-D-48-450	Dual-motor controller	48	14.4~63V	175A	450A	-
HLEC-AC1-80-375	Single-motor controller	80	30~120V	155A	375A	-
HLEC-AC1-80-450	Single-motor controller	80	30~120V	175A	450A	-
HLEC-AC1-80-550	Single-motor controller	80	30~120V	190A	550A	-
HLEC-AC1-D-80-375	Dual-motor controller	80	30~120V	155A	375A	-
HLEC-AC1-D-80-450	Dual-motor controller	80	30~120V	175A	450A	-

Introduction

The HLEC-SA Series PMSM integrated powertrain solution is high-integrated, high-performance power solution tailored MEWP, featuring high efficiency, excellent reliability, simple assembly, and low maintenance costs.

General specifications

Operating temperature		-40~55°C
Storage temperature		-40~85°C
Environmental test	Rapid temperature change	GB/T 2423.22
	Damp heat	GB/T 2423.3
	Neutral salt spray	GB/T 2423.17
Mechanical test	Sinusoidal wave vibration	GB/T 2423.10
	Sine Sweep	GB/T 2423.56
	Mechanical impact	GB/T 2423.5
EMC	Electromagnetic radiation	GB/T 30031
	Electro magnetic interference	GB/T 17799-2
	Electrostatic discharge	GB/T 17626-2
Insulation rating		500V
IP level		IP67

Applications

Boom lift   Scissor lift

Technical specifications

Model	Type	Rated input voltage	Operating voltage	Output current		
					S2-2min	S2-2min (DC)
HLEC-SA2-24-280	PMSP integrated powertrain	24	12~35V	155A	280A	-
HLEC-SA2-80-375	PMSP integrated powertrain	80	30~120V	240A	375A	-

Introduction

The HLEC-C Series VCU is functional safety controller for mobile construction machinery, conforming to EN ISO 13849 standards. It offers a compact design, flexible I/O configuration, compatibility with multiple programming platforms, and includes multiple features as short-circuit protection, status indicator LEDs and port diagnostics.
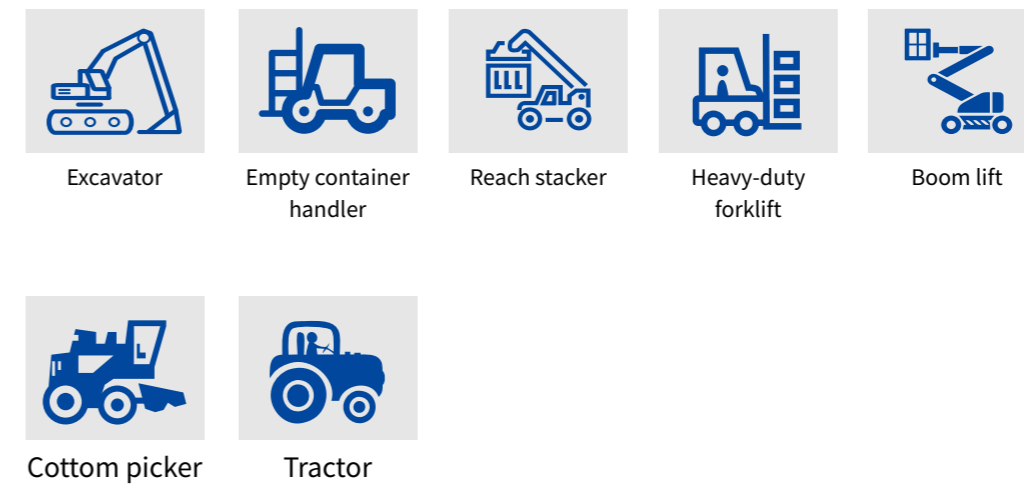
HLEC-C3-7053   HLEC-C2-3532

Applications

Excavator   Empty container handler   Reach stacker   Heavy-duty forklift   Boom lift

Cottom picker   Tractor

Input power supply specifications

Operating voltage	8~36V（MAX 40A）

Output power supply specifications

Output power supply	Output voltage range	Output current
5V reference	2 × 5V±250mV	250mA
10V reference	10V±500mV	1000mA

IO specifications

Input port	No. port	Specifications
VI(0~36V)/DIH	2	0~36V Analog signal input, Configurable to Active-high digital input
CI/VI/DIH	10	4~20mA Analog signal input, Configurable to 0~10V Analog signal input OR Active-high digital input
VI/DIH	24	0~10V Analog signal input, Configurable to Active-high digital input
VI/DIH/DIL	18	0~10V Analog signal input, Configurable to Active-high OR Active-low digital input
RI/DIL	4	0~50kΩ Analog signal input, Configurable to Active-high OR Active-low digital input
DIL	4	Active-low digital input
PI/DIL/DIH	4	Pulse signal input (Can be used as rotational sensor input), Configurable to Active-high OR Active-low digital input
PI/DIH	6	Pulse signal input (Can be used as rotational sensor input), Configurable to Active-high digital input

Output port	No. port	Specifications
AO	2	0 % Vbat to 90 % Vbat voltage analog output
AO/IO	2	4~20mA current analog output, Configurable to 0.5~5V analog output
PWMi 2.5A/DOH	16	PWM High-side output (MAX: 2.5 A), Configurable to High-side switch output
PWMi 4A/DOH	4	PWM High-side output (MAX: 4 A), Configurable to High-side switch output
PWMi 3A/DOL	7	PWM Low-side output (MAX: 3 A), Configurable to Low-side switch output
PWMi 4A/DOL	3	PWM Low-side output (MAX: 4 A), Configurable to Low-side switch output
DOH 3.5A	12	High-side switch output (MAX: 3.5 A)
DOH 4A	4	High-side switch output (MAX: 4 A)

Input power supply specifications

Operating voltage	8~36V（MAX 30A）

Output power supply specifications

Output power supply	Output voltage range	Output current
5V/10V configurable reference × 2	5V±150mV 10V±500mV	5V@400mA 10V@500mA

IO specifications

Input port	No. port	Specifications
CI (4-20mA)/VI (0-10V)/ VI (0-36V)/DIH	12	4~20mA Analog signal input, Configurable to 0~10V Analog signal input OR Active-high digital input
RI (0-15KΩ)/DIL	4	0~15kΩ Analog signal input, Configurable to Active-low digital input
PI (15kHz)/DIH	4	0-15kHz PNP Pulse signal input, Configurable to Active-high digital input
VI (0-10V)/DIH/DIL	12	0~10V Analog signal input, Configurable to Active-high OR Active-low digital input
DIH	1	Active-high digital input

Output port	No. port	Specifications
PWMi 2.5A/DOH	16	PWM High-side output with current feedback (MAX: 2.5 A), Configurable to High-side switch output
PWM 2.5A/DOH	8	PWM High-side output w/o current feedback (MAX: 2.5 A), Configurable to High-side switch output
PWM 4A/DOH	4	PWM High-side output w/o current feedback (MAX: 4 A), Configurable to High-side switch output
AO(0-5V)/IO(4-20mA)	2	4~20mA current analog output, Configurable to 0~5V analog output

Professional and experienced application development team to provide you with better solutions

We don't just meet the needs of our customers, we are able to provide innovative solutions to create more value for our customers.

In Hengli Intelligent Application Development Center, we have a professional and powerful application debugging team, which can make all the hydraulic components of the system and the engine and transmission components to achieve the most perfect match, to ensure that each customer's machine can achieve the optimal performance. We are always committed to creating new ways to create more value for our customers.

We are ready to work with you to solve your problems and challenges. Together we can develop new methods for optimizing machine-critical systems and then test, validate and opti mize them. Together we can reduce the risks you face in system development, manufacturing and testing. Together, we can bring your innovative products to market quickly and cost-effectively, differentiating them from the competition and adding value to the marketplace.

Development

We work with you to understand your unique application needs and for conception and design of the solutions.

Test

Design becomes practical with the support of full evaluation solutions during the test of the machines.

Commissioning

Together we observe the systematic solutions for the test machines and analyze the data to verify the hydraulic components and system performance.

Verification

We keep track the status of your machines and present and improve system solutions based on your feedback.